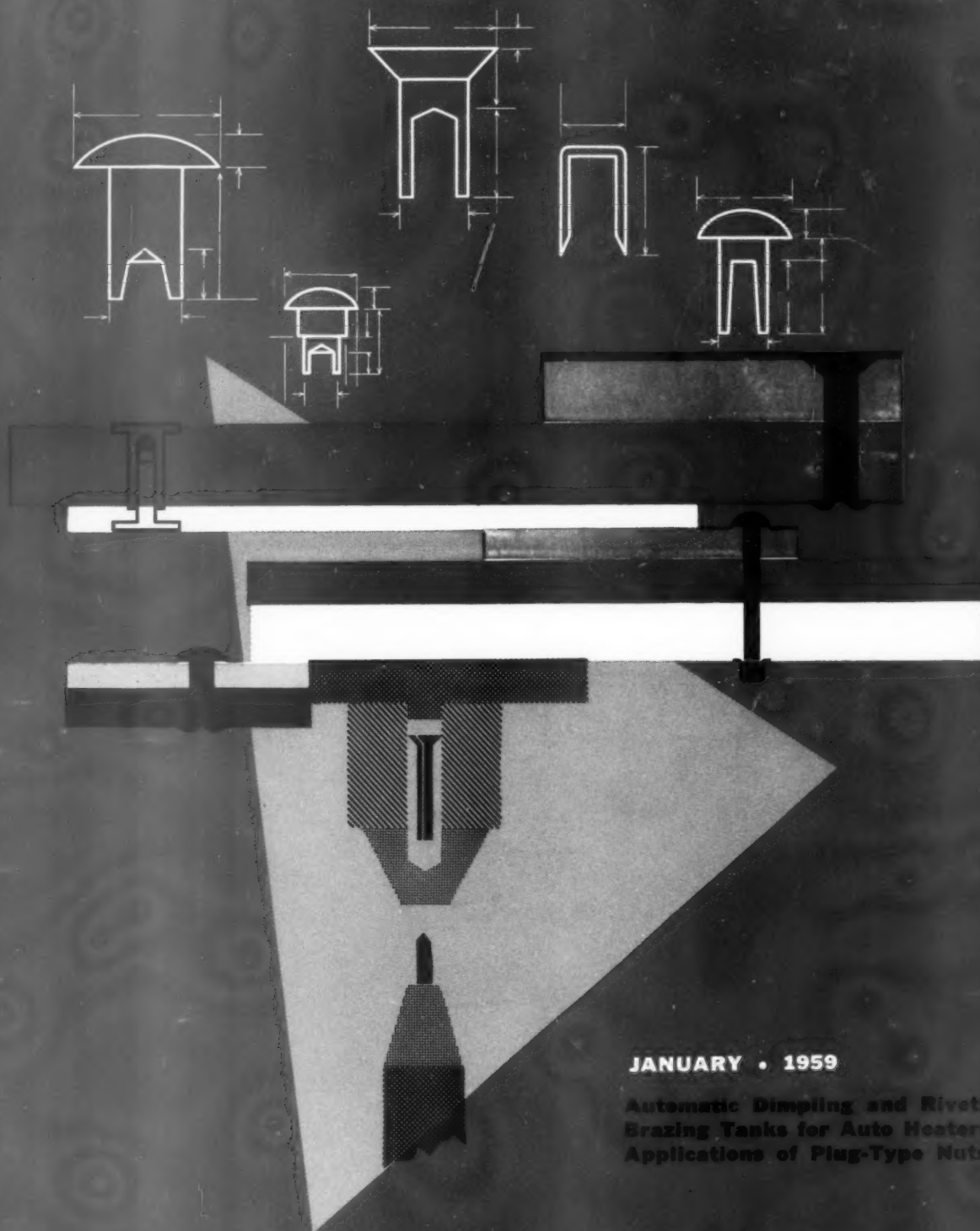


A HITCHCOCK PUBLICATION

assembly & fastener

ENGINEERING



JANUARY • 1959

**Automatic Dimping and Riveting
Brazing Tanks for Auto Heaters
Applications of Plug-Type Nuts**

Slip . . . slide . . . solution

This man is solving a fastener problem *the Pheoll way!*

The ability of the Pheoll sales engineer to devise "custom" adaptations of money-saving, new fastener advances—such as the revolutionary *self-tapping, self-locking* Schweppe Stud—is the direct result of two factors. First, the intimate and thorough knowledge of fasteners that results only from *fastener specialization*. And, second, the traditional willingness of the Pheoll "specials" team to *TRY* for the right answer, at the right price. This Pheoll combination of experience and determination is yours on *any* fastener problem . . . whether an adaptation of the Schweppe Stud or the design of a totally new fastener to meet specific application requirements. Why not give the Pheoll field representative a call on your problem . . . today?

THE MAN IN THE PHOTOGRAPH, incidentally, is a Pheoll sales engineer—*Dick Ver Halen*, a leading authority on the Schweppe Stud and a key member of the Pheoll "specials" team.



Pheoll Manufacturing Company

Industrial Fastener Division

5700 WEST ROOSEVELT ROAD
CHICAGO 50, ILLINOIS



assembly & fastener ENGINEERING

January, 1959

Volume 1, Number 4

FEATURES

1959 Forecast: "Gradual Recovery, No Boom"

7

Chamber of Commerce economist Schmidt looks for inventory rebuilding, higher profits, rising personal incomes.

Automatic Riveter Modified for Hot Dimpling

24

Douglas reduces production time on large panel sections by 50 percent, with a big boost in quality.

Auto Heater Tank Brazing

28

One operator with automatic silver brazing machine matches output of five men with torches at Blackstone.

Let's Discuss Rivet Applications

32

A discussion of the six basic types of rivets, their design, functions and relative merits.

Quick Servicing for Gasoline Pumps

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Removal of panels from Gilbarco pumps is made an easy task with use of quick-release fasteners.

Plug-Type Nuts Save Tapping

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Applications of nuts which are useful in blind locations not accessible to any tool.

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* Rivets are fundamental fasteners for many industries. They are made to thousands of print specifications. For a discussion of six basic types of rivets, their functions and merits, turn to page 32.



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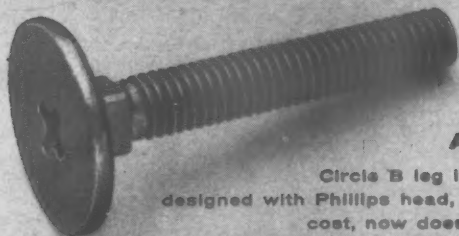
BEFORE...

Appliance manufacturer installed leg leveling bolt; used square head fastener in crating.



AFTER...

Circle B leg leveling bolt designed with Phillips head, at no extra cost, now does both jobs.



save dollars

with this sense-making idea

LITERALLY thousands of dollars can be saved through the practical application of basic bolt making principles in designing and specifying fasteners.

In the actual case shown, savings were pyramided through reduced inventory, handling, purchasing and production time; while one part was eliminated entirely.

To make this basic information available, Buffalo Bolt Company has drawn on over 100 years of experience to put together a digest of these principles.

You'll find them in our new booklet, "How to specify fasteners . . . and save". Filled with drawings and charts, it makes a handy guide in designing or buying any headed parts.

If you can use a copy, write to North Tonawanda or ask a Field Representative.



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Letters to the Editor

Hammer-Driven Rivet

On page 51 of your November issue you show the design and application of a stainless steel single-blow, hammer-driven rivet. I shall appreciate it if you will have the supplier of this type of rivets send us engineering data, sizes, etc.

Harold G. Cox
Purchasing Agent
A. B. Chance Company
Centralia, Missouri

Adjusting Screw

We are interested in the article on page 24 of your October issue which shows a long special screw. It looks like one we had to get machined for a special use. Our present requirement is small, but we may use many more later on as an adjusting screw . . . Please let us know the address of the Aero-Stat Company.

Walter J. Gabrinski
Engineering Dept.
Westinghouse Electric Corp.
South Boston, Mass.

Double-Ended Spacer

In your November issue on page 51 there appears a picture of a double-ended spacer with collars on either end . . . We have an aluminum part which looks identically like the spacer depicted except that our part is produced on a screw machine. Please advise the name of the manufacturer who produced this spacer by cold heading.

Lee Samuel
Value Analyst
General Electric Co.
Somersworth, N. H.

Titanium Solder

In the December issue on page 24 there is an article about titanium solder and flux called respectively, Curtisol and Curtiflux. I would appreciate more information on these products.

Harold K. Glaser, Eng.
Chemical & Physical Section
Westinghouse Electric Corp.
Elmira, New York

• Sources for further information as requested in these letters have been forwarded to the writers.—Ed.

Assembly and Fastener Engineering



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THE NEW ROSÁN FLOATING PRESS NUT

... a really significant answer to panel fastening problems. The .030" float, together with reduced space requirements and the functional features which provide maximum resistance to push-out and torque-out, without question, simplify design considerations. The Floating Press Nut can be used in material having a minimum thickness of .045".

The installation procedure is simple — just punch or drill one hole and press the part in place.

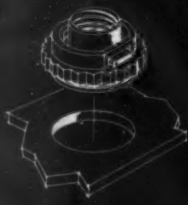
Specify Rosán Floating Press Nuts for your new designs and derive these advantages:

- Lighter weight
- Compact — with .030" float
- Maximum resistance to push-out
- Maximum resistance to torque-out
- Greatly reduced tooling costs
- Cheaper and faster installation
- Elimination of rivets

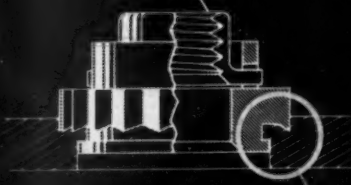
The floating press nut is available in sizes #4 thru #14 with the internal thread locking feature to Specification MIL-N-25027 (ASG).



TYPICAL
#10 PLATE NUT INSTALLATION



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1 1/4" and 1 1/2" sizes are standard

These applications show you the great variety of holding jobs for which designers and engineers are specifying these rugged king-size Allen Hex-Socket Cap Screws. They're genuine Allens, from their heads to their Leader Points. Pressur-formd, to preserve the long fibers uncut throughout their lengths. Highly accurate threads. Leader Points, of course—for fast, true starting. 1 1/4" and 1 1/2" diameters available immediately from stock—larger diameters are available on special order.



PHOTO: THE OILGEAR CO.

King-size Allen Hex-Socket Cap Screws are used to secure the flanges in this big 12-inch 3000 psi Oilgear Surge Valve.

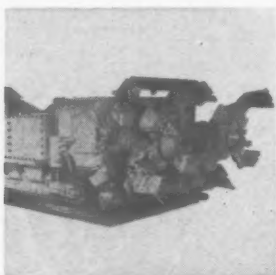


PHOTO: GOODMAN MFG. CO.

King-size Allens secure cutter arms, tilting arms, and elevating cylinders in this massive Goodman Continuous Mining Machine.



PHOTO: SODERHAMN MACHINE MFG. CO.

King-size Allen Cap Screws securely clamp the knives of this large and unusual machine that debarks whole trees.

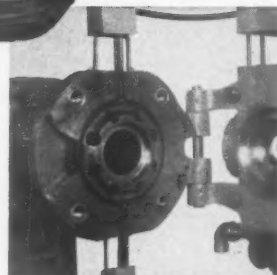






PHOTO: JOHN ROYLE & SONS

King-size Allens in the side-delivery Extruding Head of this Royle machine for application of rubber or plastic in solution.

The cost of Allen Hex-Socket Cap Screws is only a minor fraction of your assembly costs ... be sure you're getting the timesaving, cost saving advantages of genuine Allens!

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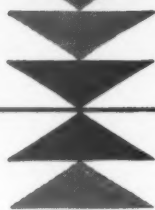
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Assembly and Fastener Engineering



THE EDITOR'S VIEW

JANUARY, 1959 VOL. 1, NO. 4

THE RESPONSIBILITY OF SHARING KNOW-HOW



Often, when one company's research team accomplishes a major breakthrough in a particular area of endeavor, it is anxious to tell the world about it. No longer do the leaders keep their secrets hidden for very long from the world.

And just one company alone—by revealing that it has solved a particularly vexsome problem and is willing to share this discovery through licensing or other means—can save millions of dollars spent by others trying to solve the same problem. These research dollars can then be channeled into still other unconquered fields.

Even the sharing of routine know-how at the production level can be widely beneficial.

An example of this can be found in Grand Rapids, Michigan, where a score of manufacturers have evolved a cooperative program of sharing much of their production know-how. There is a rather free communication between production personnel, even between competitors.

Foreman in the various companies exchange plant tours and quite often help each other with trouble shooting. Even some of the larger companies permit their

smaller neighbors to make use of their extensive laboratories and testing facilities. Actually, no one throws all his doors open for everyone to observe everything. But there is enough exchange of information so that practically everyone profits from this volunteer program.

Through such programs as the one carried on in Grand Rapids, American industry shares an ever-growing wealth of know-how. This sharing has been one of the motivating forces behind the explosive growth of our industrial economy which has brought this country the highest standard of living in the world.

But what about those companies which are prone to keep their know-how to themselves while benefitting from the generosity of others? If they truly have "secrets" which they are reluctant to share, even in a small way, they are not shouldering their part in the expansion of our economy. Since everyone benefits from overall industrial expansion, everyone has the responsibility of contributing his share. And for those desirous of wearing the mantle of a leader, it's an obligation.

Oratt E. Shultz

Managing Editor

BARTITE SEALING WASHERS

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3 SEALS DOWN BETWEEN HOLE AND THREAD

A revolutionary new type of washer with sealing compound adhered to the underside . . . makes any threaded fastener completely leakproof against liquids or vapors.

The washer is partially dome-shaped with flattened perimeter which makes smooth, even contact when tightened down.

The stable, non-aging sealing compound is chemically inert, will not split or ozone-check under high pressure, withstands temperatures from -100°F. to +250°F. without change. It provides a secure seal against water, oils, acids, salts, hydrocarbons, etc. When applied to a flat or curved surface under torque the washer does not turn . . . compression of dome shape forces live sealant into 3-way seal.

BARTITE Sealing Washers are available in all standard screw or bolt sizes through 1/2" dia., with a choice of metals and finishes.

If your product or building requires sealing, you can eliminate costly and troublesome rejects and repairs by assembling with BARTITE Sealing Washers, which make leakproofing a reality! Washer construction allows pre-assembly with fasteners to speed production—inquire about this feature from your regular screw supplier. Write for samples and descriptive bulletin B-10.



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State of Business, continued

Strikes and labor turbulence will increase in 1959. Wage and fringe settlements are likely to exceed productivity improvements by a wider margin than in 1958, giving another thrust to cost-push wage inflation.

Profits will be higher, but uneven. Their rise from the 33% recession decline will be used by labor leaders to wrest larger concessions, although everyone knows that wages and wage increases are paid out of sales, not profits.

The key economic indicators of the National Bureau of Economic Research point upward, but do not suggest an early boom.

While gross farm income may be close to the high 1958 levels, net income will be down, due to increasing operating costs and dips in hog and possibly cattle prices.

Exports from the U.S. have declined considerably more than imports. Most major foreign economies have stopped expanding. This hints no marked improvement in foreign trade in months ahead. As U.S. products are priced out of world markets, the demand for more tariff protection will increase.

Total government (national, state, local) purchases of goods and services have increased from an \$87 billion annual rate in the third quarter of 1957 to a \$93.3 rate in the third quarter of 1958, and will continue to move at about this rate—\$6 to \$7 billion in 1959—a good share for construction.

Government financing of its estimated \$12 billion fiscal 1959 deficit in commercial circles will tend to increase the money supply and send prices up.

With disposable income rising, a new period of growth in consumer debt outstanding is getting underway. Durable goods sales should improve, with auto sales increasing 25% in 1959 from 4.3 to 5.5 million.

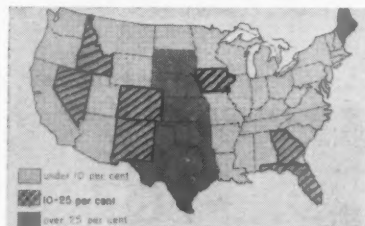
If wage demands continue to exceed normal productivity improvements, the Federal Reserve may feel compelled to restrain credit. But, here, as in the past, the Fed—which acted with wis-

dom during the recent months—is more apt to follow the loan fund market than to lead it.

The great bulk of transacting is done through financial institutions which are not within the commercial banking system and under the control of the Fed., whose actions have paved the way for bank loans and investments to rise \$12 billion higher than a year ago.

GROSS FARM SALES

Percent of Increase from A Year Ago.



Farmers' gross sales rose sharply in 1958, wheat and cattle areas leading the rise.

With no massive hurdles in the way, it seems safe to assume that expansion will continue in the period ahead, but at a reduced rate. GNP should rise by \$25 billion from the current level and reach a new high of \$470 to \$480 billion; and in 1960, should, with ease, cross the \$500 billion mark at today's prices.

The recovery has been without much benefit from capital goods revival or the automobile industry. Since the combined effect of these two large sectors should be on the plus side, this will add strength to recovery.

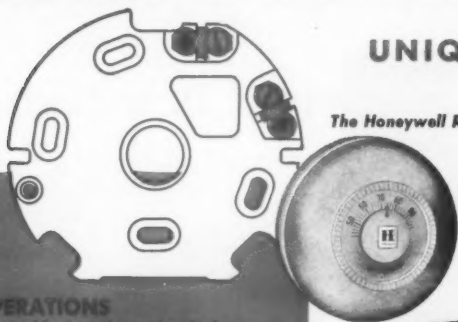
The construction industry is likely to contribute, but only moderately, to expansion above 1958 levels. The demand for loan funds will tend to keep interest rates firm or, possibly, rising.

Since the consumption of goods has exceeded production and inventory liquidation appears to have come to an end, production now will have to be stepped up, even if there is no rise in demand. If incomes rise and demand grows, as seems probable, production will be further stimulated.

The expanding factors have the edge, but not by an overwhelming margin. Prosperity has to be earned.

Bodine CASE HISTORY NO. 40

UNIQUE TOOLING SAVES 90% LABOR



The Honeywell Round

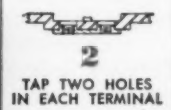
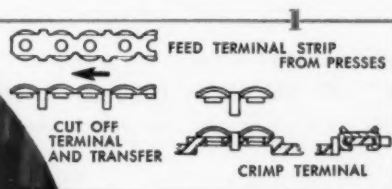
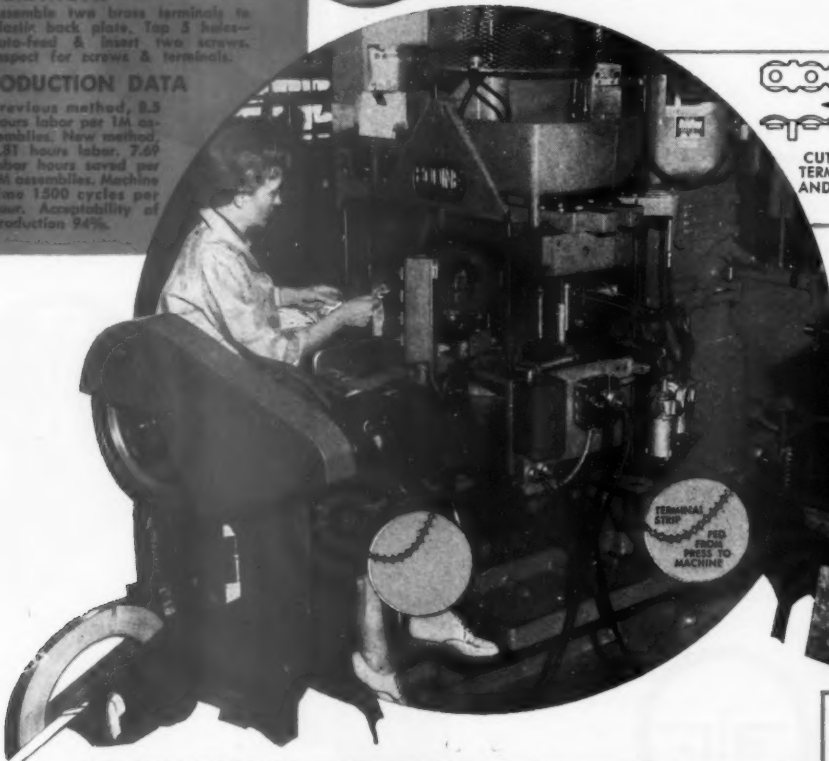
Minneapolis-Honeywell's attractive room thermostat depends upon this unique tooling set-up for economical volume production of the plastic back plate terminal block assembly shown at left. Labor hours have been reduced to about ONE TENTH of previous operations, thanks to this Bodine 42-30 Machine. It's just one example of the versatility of Bodine machines as they lend themselves for special tooling to meet specific job requirements.

OPERATIONS

Assemble two brass terminals in plastic back plate. Tap 3 holes—auto-feed & insert two screws. Inspect for screws & terminals.

PRODUCTION DATA

Previous method, 8.3 hours labor per 1M assemblies. New method, 0.81 hours labor, 7.69 labor hours saved per 1M assemblies. Machine time 1500 cycles per hour. Acceptability of production 94%.

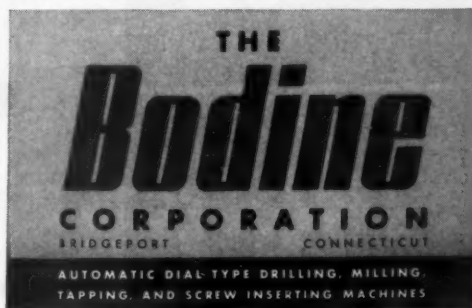


UNUSUAL TOOLING FEATURES. This complete assembly is now made in one cycle of a Bodine 42-30 Machine. The two presses stamping the terminal blanks are coupled to and cycled by the machine, feeding stampings continuously as shown. Terminals are cut-off, inserted and formed over at station one. Back plates are magazine fed. Operator's functions are largely limited to keeping back plate magazine filled and replenishing coils of brass stock on presses.

At end of operation, two inspection probes, advanced from below, test for properly filled screw terminal holes, automatically discard rejects.

With today's demand for cost-saving through grouping of assembly operations, Bodine's extensive experience in the field will prove profitably useful. We invite inquiries. Send your ideas and samples for analysis to Dept. AF-1.

*"You Can't Meet Tomorrow's Competition
With Yesterday's Machine Tools."*

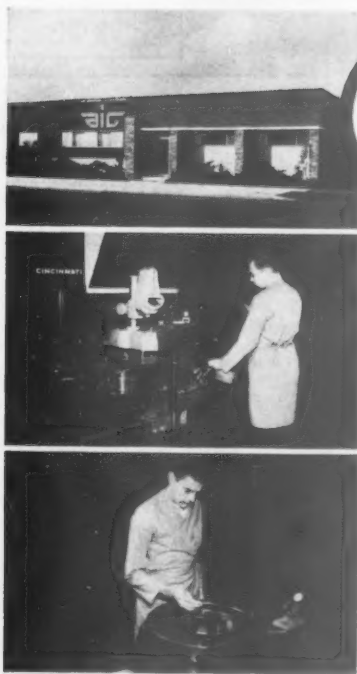


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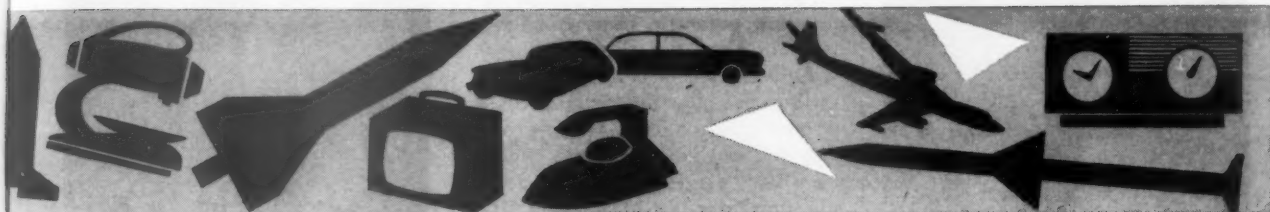


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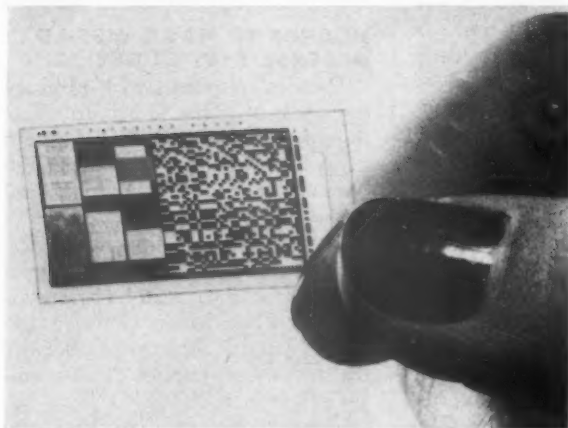
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Industry at Work



NEW MICROFILM SYSTEM FEATURES QUICK FILING, RETRIEVING OF DATA



Postage stamp-sized film record holds 12 pages of information plus index area for alpha-numeric code.



Documents are interpreted, indexed and tape punched before converted to microfilm at 60 to 1 ratio.

All 1500 pages of papers presented at the 1958 International Conference on Scientific Information were reproduced on 101 postage stamp-size film records, available for near-instant reference.

This was to demonstrate the new Kodak Minicard ultra high-speed information system which combines the advantages of microfilm, punched cards and digital computer techniques.

The first complete system is now in use by the U. S. Air Force in the Pentagon, developed by Eastman Kodak in cooperation with Magnavox. While government needs are expected to be especially adaptable to the handling, storing and retrieving capabilities of the system, specialized applications will be available for industry. Present coding methods are easily converted to the set up.

Up to 12 legal size documents, photos, charts can be photographically placed on each film record at a reduction ratio of 60 to 1. Through punched tape, the information is coded and films filed on sticks of steel holding 2000 films. (One Minicard file does the job of 500 letter files.)

After desired films are retrieved by a machine which processes 1000 films a minute, films can be studied at normal size in an analysis viewer. Hard copies of any images required can be reproduced automatically on an enlarging machine in 12 seconds.

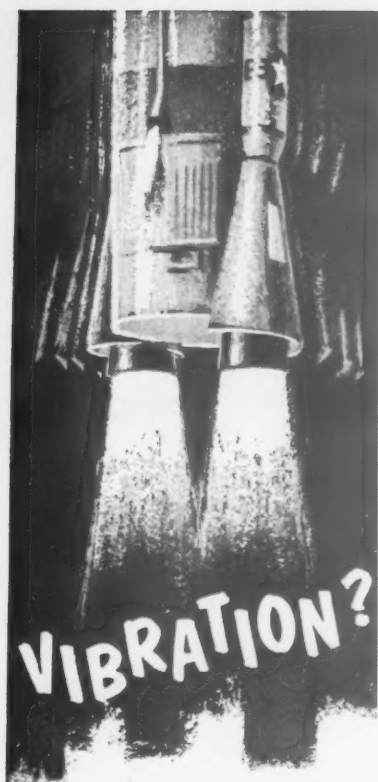
BRITISHER POSES JET AIRLINE PROBLEMS

Jet airplanes, for some airlines at least, may introduce more problems than they solve, according to an English engineer speaking at a meeting of The American Society of Mechanical Engineers.

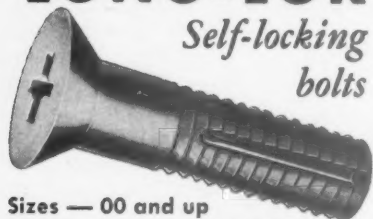
As a result, he implied, the new family of turbo-props—propeller driven planes powered by gas turbine engines—will be with us for many years.

Citing the comparative speeds and operating costs of pure jets versus turbo-props, D. J. Lambert of Vickers Armstrong Aircraft Ltd., Weybridge, England, pointed out that while it would cost some \$7

continued



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Qualified to MIL-F-18240

Long-Lok self-locking elements for all male threads hold fast against vibration — provide a seal against liquid leakage — just tap a hole and use Long-Lok, no inserts, safety wire or lock washers needed.

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Industry at Work, continued

per minute to keep a pure jet circling above an airport waiting its turn to land, a comparable turbo-prop would cost only \$4 per minute. An airline using a fleet of 20 pure jets, which experienced an average of four minutes of delay and a traffic pattern adding ten miles to the flight distance, would find costs running over \$2 million per year higher than those of a competitor using turbo-props. "By present standards this would be a very respectable profit for a medium sized airline, except that it happens to be cost, not revenue," Mr. Lambert said.

As for the relative speeds, Mr. Lambert said, "A pure jet may suffer through waiting until a suitable altitude is clear or through being forced to make a detour to climb to, or descend from, its assigned altitude clear of other traffic. This delay does not have to be very long to allow the turbo-prop to be speed-competitive.

PRINT STANDARD SPECS OF HEAD TAPPING SCREW

American Standard B18.6.4-1958, "Slotted and Recessed Head Tapping Screws and Metallic Drive Screws," has been approved by the American Standards Association and published by The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N.Y.



ELK RADAR TARGET is a new safety device for small craft, registering a large image on radar screens up to seven miles in any direction. Even wooden boats acquire visibility with this target.

HUGHES TO MAKE MISSILE DEFENSE SYSTEM DEVICE

Hughes Aircraft will produce elements of "Missile Monitor" air defense systems for use by a field army, the result of a \$30 million contact from the US Army Signal Corps.

The system is the operations control center at battalion level for over-all mobile defense operation attached to an army in the field. Production in Fullerton, Calif., will involve 1600 employees.

The system coordinates airborne target information from Army radar to missile batteries like the Nike and Hawk.



In record construction time of 180 days, the American Bridge Division of U.S. Steel opened this 3,480 ft. long suspension bridge for traffic in Dec. It is 215 ft. high over the St. Lawrence River at Messina, N.Y.

CHEMICAL ENERGY OFFERS NEW PROPULSION SYSTEM

A new method for converting chemical energy directly into electrical power could revolutionize conventional propulsion systems.

"Fuel cells" (related to auto storage batteries) have achieved almost 100% "fuel" utilization and energy conversion efficiencies of 70% in laboratory experiments at Lockheed Missiles Systems. This compares with steam (35%) and internal combustion (even less) engine efficiencies.

Basic difference between the lead acid battery and fuel cells is that the battery's active materials are inside the case while the electrochemical fuel is stored outside so the components of the cell are not consumed in the electrode reactions.



Dr. Ross A. Quinn, Lockheed scientist, demonstrates how a fuel cell converts energy directly into electrical energy to power motor which spins plastic disc.

Energy is measured in watt hours per lb. of total weight. Auto batteries yield between 8-10, while a fuel cell is being developed to produce 100 watt hours. Dr. Morris Eisenberg, project director, says it would take only an 80 watt-hour cell to "excite Detroit's engineers and designers."

Major advantages include long operating life, adaptability to both large and small-scale applications, lack of noise or fumes and ease of maintenance since there are few moving parts.

A 150 watt-hour cell per lb. would power every type of aircraft or spacecraft and to provide power for communication in satellites.

a
quarter-turn
fastener

for thin material and
miniaturized
equipment



CAMLOC *low cost/light weight*

5F series

Camloc's new small, lightweight 5F Series features high strength-weight ratio plus the quick-operating advantages of a $\frac{1}{4}$ -turn fastener... in a size and weight that offers new design possibilities to original equipment manufacturers! Particularly adaptable to thin materials and miniaturized equipment like airborne electronics, small electro-mechanical and computing devices and communications components. Ideal for attaching lightweight components in "packaged" equipment or for holding access panels on everything from washing machines to radar units.

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Unusual fasteners are everyday occurrences at Lamson. Some are fairly common; some are not even in existence when we get the order. But we produce each one with the same highly-developed engineering and manufacturing methods that keep costs low and quality at its optimum in Lamson's standard fastener products. Conversely, these same standards benefit from the skill and ingenuity derived in producing special items. These are reasons why you should look to Lamson for leadership in fasteners.



The Lamson & Sessions Co.

5000 Tiedeman Road, Cleveland 9, Ohio • Plants at Cleveland and Kent, Ohio • Chicago • Birmingham



Assembly and Fastening Ideas



ROTATING FIXTURE SPEEDS ASSEMBLY WORK

By combining the use of pneumatic screwdrivers and a small caster-mounted fixture, one manufacturer of air conditioners has speeded the assembly of evaporator coils.

The work fixture, set up for one or two-man operation, consists of a vertical center leg mounted on a circular piece by angle-iron supports secured to a 24" square base. The entire fixture rotates around a $\frac{3}{4}$ " metal pin on a 3' sq. sheet of boiler plate. The rotation permits one-man operation if desired.

Operators fit two evaporator coils on an A-type mounting on the common base plate, using sheet-metal screws. They then rotate the fixture 90° to fasten two side plates. Thus, one work station provides rapid assembly of several components.

The pre-set torque feature of Thor pneumatic screwdrivers prevents stripping the fine screw threads—improving product quality and minimizing "break-in" time for new workers.

PINS SOLVE REACTOR FASTENING PROBLEM

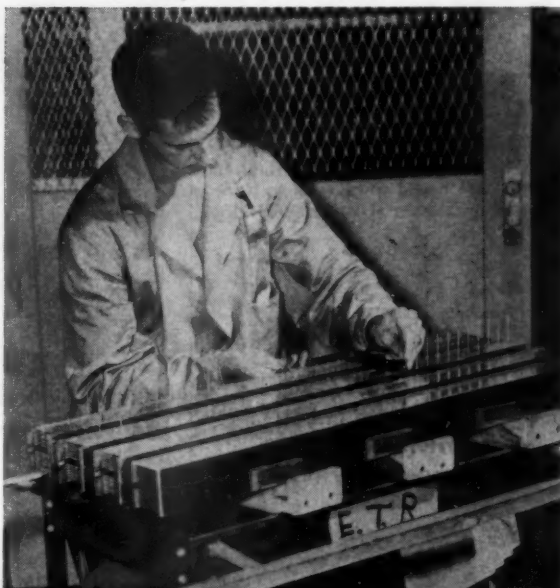
A new type of nuclear fuel element, assembled with aluminum "pins", has made possible for the first time full-power operation of a test reactor.

The reactor involved is the engineering test reactor (ETR) operated for the United States Atomic Energy Commission at the National Reactor Testing Station, Idaho, by Phillips Petroleum Co.

One of a series of government-financed facilities built primarily to test nuclear engineering developments, the reactor has been limited to 50% of its rated power during operation due to the buckling of fuel element plates under hydraulic forces at higher power levels.

Babcock & Wilcox developed the aluminum pin technique of fastening side plates to fuel plates at

continued



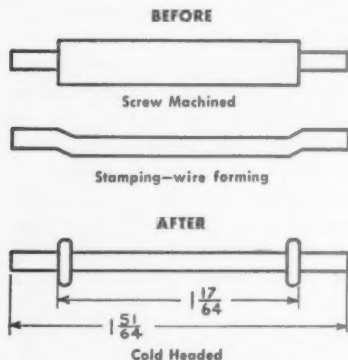
COST REDUCTION PROGRAM CALLS FOR COLD HEADING

Hassall Re-Design Often Means Big Savings on Parts

The most important consideration we can point out to the designer or purchaser of fasteners and small parts is that any part which can be machined from rod stock is also potentially available from the cold heading manufacturer. This technique offers speed of production, without scrap loss, plus superior strength and appearance for low cost and high design efficiency.

Perhaps our greatest contribution to your operation is our re-design service. An expert cold heading designer can very often study your drawings and come up with a modified part which will be lower in cost, stronger structurally, and easier for you to assemble.

This spacer is typical of such a Hassall re-design. Note the customer's drawing... this is a stamping, not too accurate, with poor bearing surfaces and not too easy to handle in assembly.



Now, look at this spacer as re-designed for cold heading. Now, a double collar spacer which is very accurate, structurally much stronger, and with much better bearing surfaces. And lower in cost!

Given complete specifications, including a drawing and an idea of the application, we can quickly tell you whether or not it will be advantageous to have your part or fastener **JOB-DESIGNED** by **HASSALL**.

Write today for your copy of our new Catalog No. 106.

John Hassall, Inc.

P. O. Box 2217

Westbury, Long Island, N. Y.

Manufacturers Since 1850

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Assembly and Fastening Ideas, continued

its Nuclear Facilities Plant in Lynchburg, Va., in an effort to provide a fuel element which was more corrosion-resistant, strong

and dimensionally stable. The ETR attained its full power of 175 MW for the first time with the new core.

QUICK-SETTING ADHESIVE BONDS DOSIMETER PEN PARTS

Adhesives came to the rescue of the Universal Transistor Products Corp., Westbury, N.Y. mak-

ing possible the assembly of delicate parts in a dosimeter pen on a production line basis.

Worn like a fountain pen, the instrument measures the total gamma radiation to which the carrier is exposed to over a given period of time, reading appearing on a scale which is read through an eye piece at one end. It is used extensively in research laboratories and hospitals.

Chief assembly problem was the attaching of a fine quartz fiber element to its mountings. Eastman 910 adhesive provided the necessary requirements: ability to bond quartz fiber to aluminum, rapid set time and sufficient conductivity. The adhesive is also used to join or mount several other components, including the lens system and two internal barrel sections.

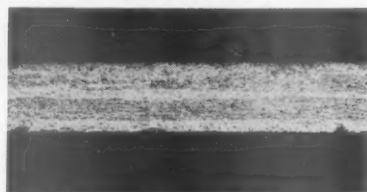


Quartz fiber is bonded to two pins on an aluminum wire in delicate dosimeter assembly.

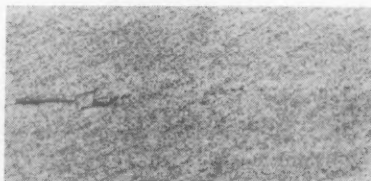
ULTRASONIC SEAM WELDER JOINS DISSIMILAR METALS

Ultrasonic seam welding has been developed to weld sheets of dissimilar metals continuously. The new Westinghouse apparatus eliminates the need for surface preparation, welds metals previously not fusion weldable and does not deform the metal pieces being joined.

Sheets of metal are passed between two wheels vibrating at 20 kc per second. The periphery of



Photomicrographs of copper-to-copper (above) and aluminum to aluminum (below) seam welding.

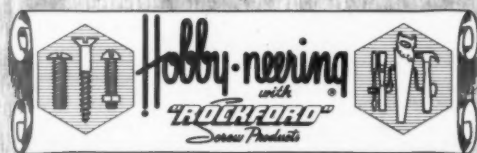


these wheels press against the metals on opposite sides of the sheets. At the point of contact, the wheels break up the oxide coating on the metal surfaces and by a kneading action weld the metal lattices on the surfaces. No electric current is passed through the weld. A variable speed drive moves the metals through the unit as the weld is completed by the wheels.

The center of the wheel is at-

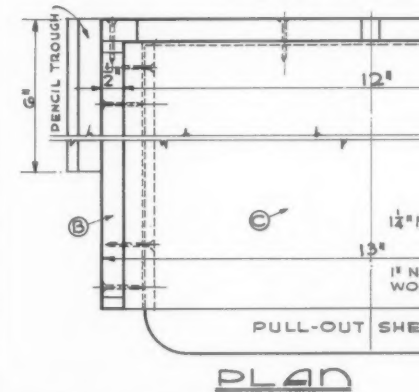


Ultrasonic seam welder joins dissimilar metals without deformation.



ORIGINAL DESIGNS

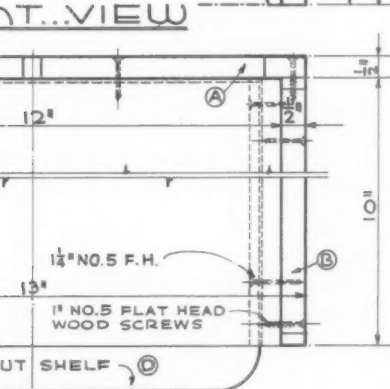
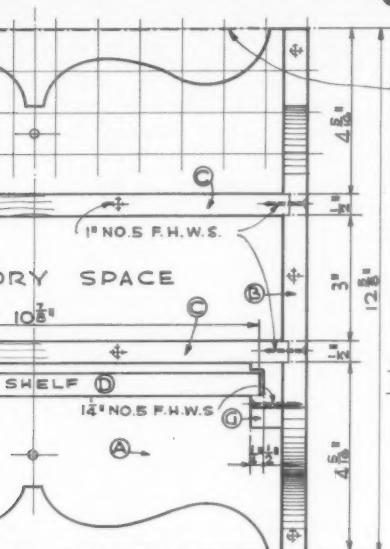
JANUARY 1959



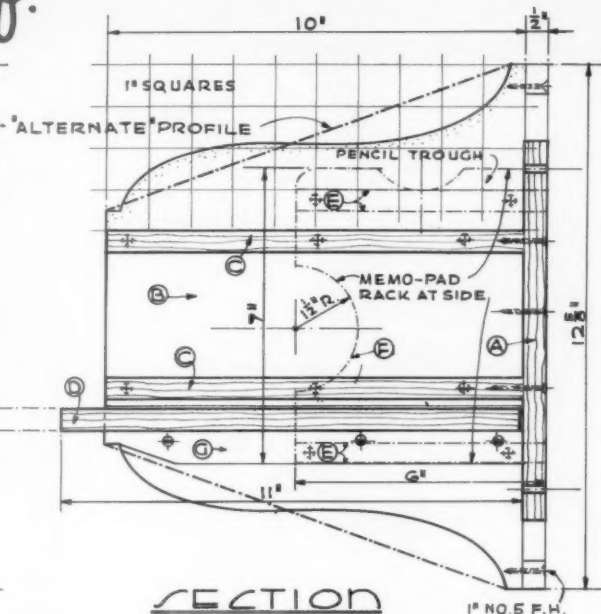
PLAN

HAGER DESIGN STUDIO 5-20-56

Phone.. Shelf.



SCALE: INCHES 0 1 2 3 4 5 6 7 8 9 10 11 12



MATERIALS:

- 1 PC. 1/2" x 12 1/2" x 13" "A"
- 2 PCS. 1/2" x 12 1/2" x 10" "B"
- 2 " 1/2" x 10" x 12 1/2" "C"
- 1 PC. 1/2" x 10 1/2" x 11" "D"
- 2 PCS. 1/2" x 1/2" x 6" "E"
- 1 PC. 1/2" x 7" x 6" "F"
- 2 PCS. 1/2" x 1 1/2" x 10" "G"

"ROCKFORD" WOOD SCREWS
10 - 1 1/2" NO. 5 FLAT HEAD
16 - 1" NO. 5 " "
(OVAL HEAD ALTERNATE)

NOTE:

IF PLYWOOD VENEER IS USED APPLY WOOD TAPE TO ALL EXPOSED EDGES TO MATCH THE WOOD OF VENEER.

FOR PLAIN PROFILE FOLLOW DOT & DASH LINES MARKED "ALTERNATE"

INSTRUCTIONS:

IT IS ALWAYS PLEASANT TO MAKE OR RECEIVE A PHONE CALL WHEN THE PHONE IS AT A CONVENIENT PLACE WITH PENCIL, MEMO-PAD & PHONE BOOK HANDY.

THIS COMPACT SHELF HAS SOMETHING ADDED. THE SLIDING PULL-OUT SHELF ALLOWS MAKING NOTES OR LOOKING UP A NUMBER EASY. PASTE OR TAPE A LIST OF IMPORTANT TELEPHONE NUMBERS INCLUDING, POLICE, FIRE DEPT & YOUR FAMILY DOCTOR.

PLYWOOD VENEER OR SOLID HARDWOOD, FINISHED NATURAL OR STAINED & VARNISHED WILL GIVE GOOD EFFECTS.

DRILL HOLES FOR "ROCKFORD" WOOD SCREWS.

How about sending me snapshots of your finished "Hobby-neering" projects? Thank *HEM*

Hobby-neering®

SERIES.. NO. 8

PROJECT 12	Designed by <i>ADER</i>
USE FOR COMMERCIAL PURPOSES IS STRICTLY FORBIDDEN	OF ROCKFORD

★ "ROCKFORD" PLACE BOLTS



APPLICATIONS

Gasoline Engines
Diesel Engines
Farm Implements
Chassis & Axle Parts

Main Bearing Caps
Fly-Wheel Attachments
Connecting Rod Caps
Harmonic Balancers
Damper Assemblies
Manifolds-Intake
Torque Converters
Axle Assemblies
Truck Motor Mounts

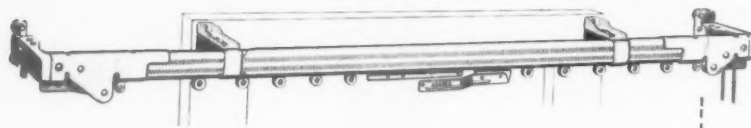
Manifold-Exhaust
Universal Joints
Water Pump Brackets
Fan Brackets
Sprocket Assemblies
Idler Pulleys
Chain Case Cover Bolt

"ROCKFORD" PLACE BOLTS

The slotted-type bolt is a one-piece cold formed bolt featuring in its head design an elastic diaphragm which furnishes additional elastic elongation when bolt is tightened. It is formed with six slots in the upper face of the head and a circular recess adjacent to the shank on the seating or lower face. When the bolt is tightened, the recess places the load on the outer surface of the seating face causing the elastic diaphragm thus formed to act as a controlled spring element. For a complete description and the uses of Place-Bolts write us for data.

For better and stronger assemblies, check the use of "ROCKFORD" PLACE-BOLTS, in your assembling problems.

★ HERE THERE AND EVERYWHERE with "ROCKFORD" Screws and Bolts ★



fine drapery hardware

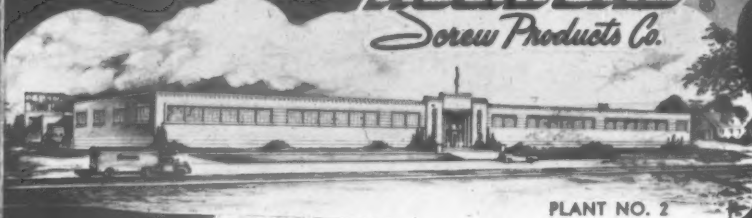
Manufactured by:
GRABER COMPANY
Middleton, Wisconsin



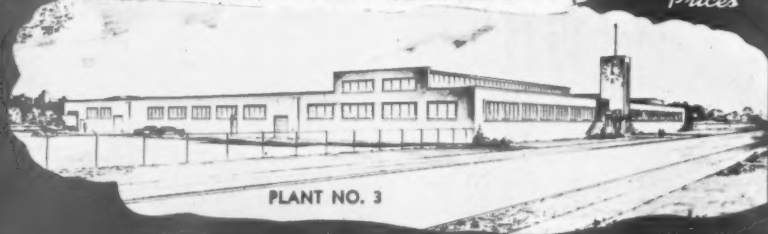
"ROCKFORD"
Screw Products Co.

GENERAL OFFICES
AND PLANT NO. 1

*Write
for Latest
Catalogs
and
Prices*



PLANT NO. 2



PLANT NO. 3

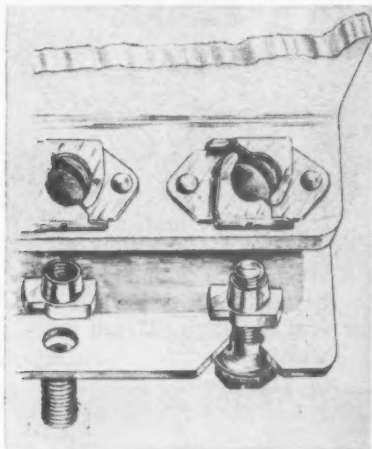
"ROCKFORD" Quality - Controlled Threaded Fasteners
Within Reach of Any INDUSTRY.

A Complete Line of Fasteners Fabricated in Our Three Modern Plants

tached to a transducer assembly used to convert electrical energy to the high-frequency mechanical vibrations.

Two wheels of aluminum .010" thick have been seam welded continuously at a rate of 15" per minute. Light silver foil was welded to 1/4" copper strap at a rate of 20" per minute. These welds were made while supplying 500 watts to each transducer or 1000 watts to the entire unit.

NEW DESIGN PRINCIPLES IN QUICK RELEASE PANEL NUT



A quick release panel fastener for use on access doors and removable panels of buses, trucks, trains and other types of mobile equipment, has been developed by the Elastic Stop Nut Corporation of America, Union, N.J.

In operation, as the bolt is rotated, the self-locking nut turns from the entry slot of the basket and lifts on the beveled edge of the nut lugs into the basket recess. The lifting action of the nut draws up the screw and attached cover plate into firm, positive contact with the base plate at the preset loading.

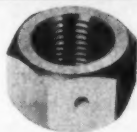
Designed on a new principle, the ESNA type "FR" quick release fastener uses a self-locking nut as the latch-lock element in the basket retainer. Requiring only a quarter turn of the bolt to complete the lock-unlock action, the fastener offers new performance features.

Use of a threaded fastener as the locking element permits an infinite grip adjustment for the full length of the bolt.

MACLEAN-FOGG

gives you product superiority and fast, low-cost assembly with the M•F line of lock nuts and standard nuts in all sizes "off the shelf"

M•F TWO-WAY LOCK NUT



for faster application with consistent torque

This all-metal, double chamfered, re-usable lock nut can be applied to bolt threads from either end. The center locking principle permits bolt end to be flush with top of nut.

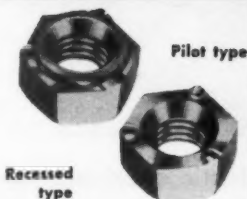
M•F UNI-TORQUE LOCK NUT



for high torque consistency in full and jam thickness

This consistent-torque lock nut will withstand terrific vibration and shock loading; retains its locking ability for as many as 10 RE-applications.

M•F PROJECTION WELD NUT



for low-cost assembly

Solve production delays, cut manufacturing costs—fuse nut to the product in exact location. Engineered for assembly simplification. The welding of nuts to sub-assemblies permits the use of screws or bolts in the main assembly without the need for holding nuts from turning, cutting time and labor.

Both types available with the patented M•F Two-Way locking feature. Each type has three welding projections, eliminating rock and guaranteeing a uniform weld.

M•F SPIN LOCK NUT



the nut with the built-in lockwasher

This free-spinning one-piece lock nut eliminates the need for supplemental locking devices such as lockwashers. Cuts purchasing and inventory costs.

*for you
for the asking*

The M•F Products Catalog—valuable data on torque, bolt tension and dimensions as well as on other available products.



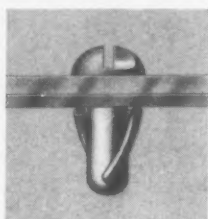
MAC LEAN-FOGG Lock Nut Company

5535 N. WOLCOTT STREET • CHICAGO 40, ILLINOIS

Use postpaid card. Circle No. 212

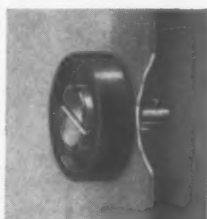
How can you use **SPRING-LOCK?**

THE FASTENER WITH USES UNLIMITED



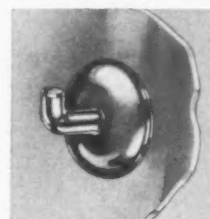
As a standard removable fastener or a blind rivet

A quarter-turn locks, un-locks. Load-carrying steel arms lock securely, don't loosen under vibration. One-piece (no receptacle) simplifies blind fastening.



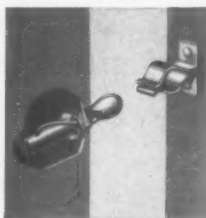
As a roller axle

Now used on range drawers, kitchen cabinets, file cabinets, desks. Cuts installation costs, saves time. Designed to suit. Available with or without roller.



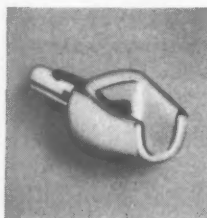
As cup hooks

High-strength polystyrene or chrome-plated die cast zinc. Inexpensive, sturdy and good-looking. Simply and quickly installed with a twist of the wrist.



As a cabinet door strike

Millions in use on kitchen cabinets, automatic dishwashers, etc. Standard strikes available from stock, or custom designed for special contour requirements.



As a plastic shelf support

... with the heart of steel for extra strength. Millions now used by all major refrigerator manufacturers. Complete flexibility of head design.

What is your application for **SPRING-LOCK?**

Send us your application inquiries. Our engineers will answer you specifically and promptly. Or, write today for the Simmons Catalog. **SPRING-LOCK** samples are available upon request.

SIMMONS FASTENER CORPORATION

1796 North Broadway, Albany 1, New York

QUICK-LOCK

•

SPRING-LOCK

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ROTO-LOCK

LINK-LOCK

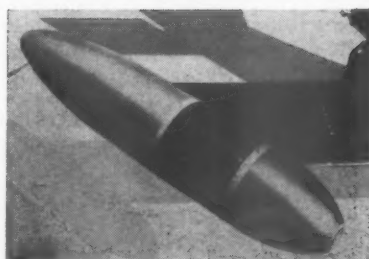
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DUAL-LOCK

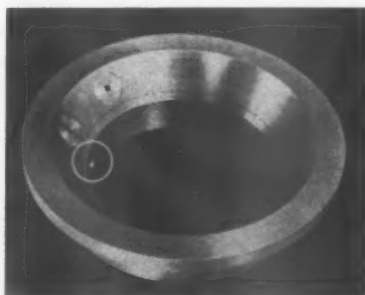
SEE OUR 8 PAGE CATALOG IN SWEET'S PRODUCT DESIGN FILE

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REPORTS FROM THE FIELD



Forming molds for wing tip radome (above) were bonded (below) from scrap metal.



METAL BONDING SALVAGES SCRAP TO CUT TOOLING COSTS

Using structural metal-to-metal adhesives to salvage once-discarded scrap tooling metal is saving one aircraft firm close to \$20,000 annually in tooling costs.

The Ryan Aeronautical Co., San Diego, Calif., faced a production crisis when a male mold could not be delivered soon enough to meet delivery on a 4' fiberglass shell for wing-tip radomes on the Firebee, a drone target for the Air Force and Navy.

Engineers conceived the idea of building the mold in the same pattern-making procedure by which wood blocks are glued together to build up a forming block. Instead of wood blocks, scrap pieces of cast aluminum metal were bonded together with Narm-

co Metlbond 4041, an elastomer modified phenolic in unsupported film form with liquid metal prime.

Success in this experiment has led to further applications where the metal is rough sawed, bonded to form blocks and then machined to the size and configuration of the desired tools.

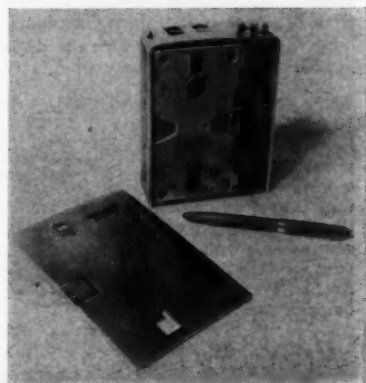
The blocks are prepared for bonding by being cleaned with both a methyl-ethyl-ketone wipe and alkaline and rinsed with water. When dry, faying surfaces are primed with Metlbond type 11 to .0005" thickness and air-dried for an hour. Special tape is interposed between the faying surfaces and the assembly is subjected to a cure cycle of 350°F at 100 psi for an hour.

SCREW-LOCK INSERT AIDS MINIATURE RECORDER ASSEMBLY

To prevent 400 feet of recording tape in a new miniature recording unit from creeping up or down on the tape drive wheel, it was necessary for the Dictaphone Corp., Bridgeport, Conn., to maintain alignment of plus or minus one half degree between the vertical driving shaft and horizontal mounting plate.

At one time, a threaded bushing was mounted in a triangular bearing plate. The screw mounted jewel was inserted and locked in place with a second jamb nut. Incorrect installation of the nut would often force the bearing against the end of the drive shaft or the drive shaft alignment would

continued



Dictaphone found self-locking inserts aided recorder assembly. Inserts are placed in drilled, tapped bushings before assembly.



Loctite tames vibration on chain saws

The HOMELITE six-horsepower chain saw weighs only 19 pounds. So much power per pound requires maximum resistance to vibration in the fasteners holding parts together.

LOCTITE, the liquid lock washer, locks all critical fasteners on this gasoline-driven chain saw... providing dependable service in rugged field use.

LOCTITE Sealant is a liquid which hardens between metal parts to form a bond with greater holding power than any mechanical locking device. The added holding power of LOCTITE-treated fasteners allows Homelite to use reduced tightening torques and thus avoid stripping threads in the aluminum castings.



While adding to product reliability, LOCTITE provides substantial cost savings. At Homelite, the 27 different size fasteners required in assembling the chain saws are treated with LOCTITE by tumbling in plastic bags. Treated screws store for days... lock only when assembled.

There's a Loctite application method suited to all production requirements. If your product faces shock and vibration in use, you can eliminate breakdowns due to loose threaded fasteners... cut service cost and customer complaints... by using Loctite. Write for literature and free sample.



LOCTITE® SEALANT

AMERICAN SEALANTS COMPANY

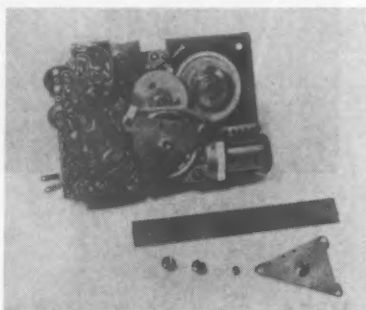
133 Woodbine St., Hartford 6, Conn.

In Canada: J. S. Parkes & Co., Ltd., Montreal

Reports from the Field, continued

not be within permissible tolerances.

To provide correct alignment



Wire thread inserts align the driving shafts of portable recorders.

and positive locking, Dictaphone utilized a self-locking wire thread insert. First, a 1/4-32 Heli-Coil screw-lock insert was installed in the mounting plate bushing. Then an automatic screw machine trued the bushing diameter in relation to the diameter of the insert. The bushing and insert were then located on the mounting plate, fastened in place and assembled on the supporting brackets.

The screw mounted bearing is held securely in place by a grip coil near the center of the insert, which is made from 18-8 stainless steel wire having an ultimate strength of 200,000 psi.

JET WING, BODY SKIN FLUSH-RIVETED WITH 21-TON MACHINE

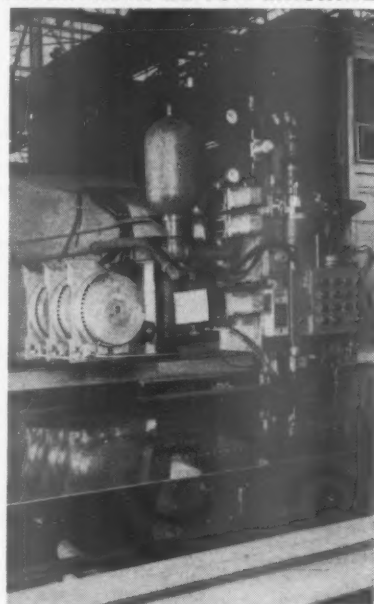
Four giant riveting machines have begun fabrication of wing and fuselage panels for the Convair 880 and 600 jetliners in San Diego at a rate never before realized with production equipment.

Each of the 21-ton machines drills, countersinks and counterbores a hole, inserts a rivet, squeezes it with up to 15,000 lbs. pressure, and shaves off the head at the rate of one rivet every three and a half seconds in attaching the aluminum skins to the framework. Riveters were designed and built by the Nuclear Products—Erco div. of ACF Industries, Inc.

Each riveter measures 12½' high, 15' long and 6' wide, with a 10½' throat depth. These dimensions permit the riveter to handle skin and stringer panels up to 12' wide and 25' in length. The throat depth enables it to rivet skins with extreme curvature.

Automatic positioners move the wing panels back and forth through the jaws of the riveters, positioning the panels in exact location for the riveting cycle. Hole locations are determined by template and electric eye pick-up. The entire operation is controlled by an operator from a remote control pushbutton console or panel by predetermining desired manual or automatic cycling.

The riveters use a modified Straylor rivet which, when used with the Convair-developed Scotchweld bonding process, cre-



Riveter finishes 5-part cycle fastening plane wing skin to stringers.

ates a metal-to-metal fuel-tight seal. This is necessary because the wings of the 880 and 600 function as fuel tanks.

Ernst Longenecker, director of engineering, said that in addition to completing a cycle every 3½ seconds, the riveters shave off the rivet heads "to a flushness of up to one-and-a-half-thousandths-of-an-inch, finer than a human hair." Such wing surface smoothness has never before been achieved with high-speed production riveting equipment using horizontal broaching shaving methods, he added.

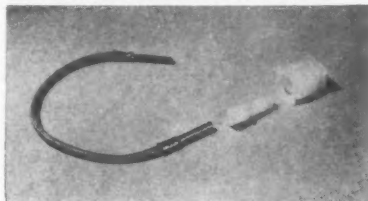
COUPLINGS LOCK, SEAL SEPARATOR SCREENS



Reduced downtime was a major reason for the incorporation of stainless steel band couplings by the Southwestern Engineering Co., Los Angeles, in the manufacturing of industrial separators.

The Marman couplings are used to lock and seal from one to three screens on each vibrating separator. While holding the spacing frames and screen cloth assemblies rigidly together, the couplings also permit quick disconnecting for changing of screens. This feature makes it convenient to rotate the spacing frames so that discharge spouts project in any desired direction.

CELLULAR CONSTRUCTION AIDS PATCHCORD SYSTEM



Units of patchcord system are a lead wire and nylon plug and block.

Engineers at AMP Inc., Harrisburg, Pa., have developed a new type of cellular construction using molded nylon blocks to prevent current leakage between circuits in a shielded patchcord programming system.

The blocks, and plugs for removable patchcords, made by Gries Reproducer Corp., are constructed with alternating interlocking metal strips. This cellular system prevents current leakage while providing the strength advantages of a metal patchboard.

Especially adaptable to com-

continued

SINCE
1887

MILWAUKEE
WROT WASHERS

...now they're

WASHED!

Quality-conscious production methods call for modern materials ... even down to your nut-and-bolt assemblies. Now you can buy Milwaukee WASHED WASHERS to promote cleaner workmanship, cleaner product-assembly, and upgrade the morale of production workers through a thoughtful regard for personal cleanliness.

Today, all popular sizes of Milwaukee U. S. Standard and S.A.E. Washers, Rivet Burrs and Machinery Bushings are washed by a special process that removes all oil, graphite or other grime. In addition, this Milwaukee Wrot Washer washing process includes rust resistant treatment.

Since the introduction of this improved processing of Milwaukee Wrot Washers, Industry has responded with a most enthusiastic vote of approval. Many production orders specify "WASHED WASHERS" ... but whether you specify "Washed" or not, that's the way they are supplied ... clean washers for clean workmanship and clean workers ... to match your highest production standards.

Specify "Milwaukee Wrot Washers" for better Quality Control.

Modern Packaging for Easier Identification...

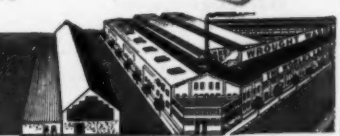
In keeping with a policy of "dressing up" the washers themselves, by our special washing process, they are now put up in convenient, attractive 1-lb. and 5-lb. packages for easier identification and handling.

Your No. 1 Source for Quality Washers

**WROUGHT WASHER
MANUFACTURING CO.**

The World's Largest Producer of Washers

2195 S. BAY ST., MILWAUKEE 7, WIS.

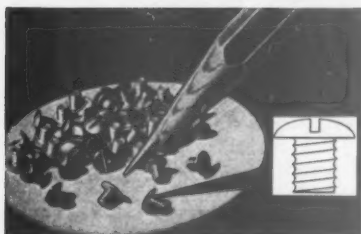


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OVER **5** TIMES
THE RATE
AT **45%** LESS COST



**Another example of how
Hubbell Cold Heading
produces Better Parts at
Faster Speeds, at Lower Cost.**

THE PART:

Special 1-64 Miniature Binding Screw

THE MATERIAL:

18-8 High Tensile Stainless Steel

THE METHOD:

Hubbell Cold Heading in place of screw machining

THE RESULT:

a. Production increased from original rate of 7000 pc. p.d. to cold heading rate of 40,000 pc. p.d.

b. Cost reduced 45%

c. Finer Quality—More Economical Production

1. Higher Tensile Strength
2. Cleaner, Stronger Threads
3. No Scrap Waste
4. No Separation from Chips

Hubbell Cold Heading may provide equally dramatic results for you. Whether it is presently cold headed or not, send blueprint of part or sample for analysis and estimate.

HARVEY HUBBELL, Inc. Machine Screw Dept.
Bridgeport 2, Connecticut

Kindly estimate on the enclosed
Sample (Blueprint). Quantity _____

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Company _____
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Reports from the Field, continued

puters, test equipment, business machines and processing equipment, the system incorporates a molded-in hole in each block, so that standard, coaxial or shielded patchboards can be inserted.

The success of the "mating

sleeve" depends on the nylon's property of "elastic memory" which enables the inserted plug and lead wires to be pulled out without the hole losing its original dimensions, thus retaining its "locking" action.

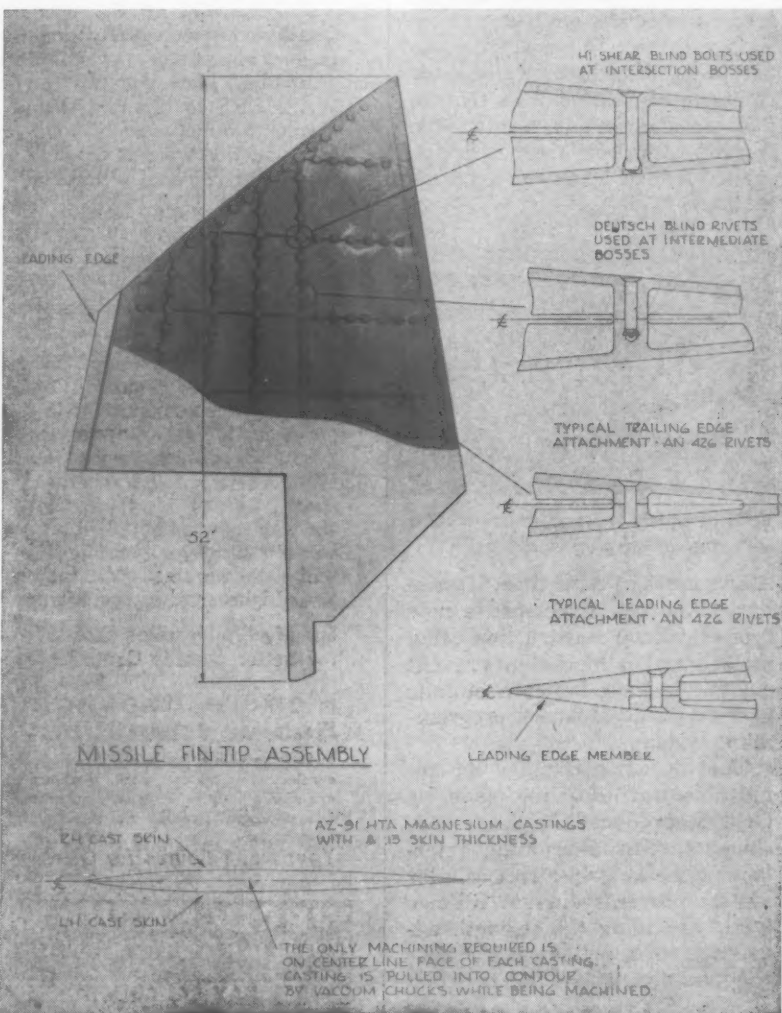
MISSILE TAIL SECTIONS BUILT BY CASTING, BOLTING

Thin tail surfaces for the Navy Regulus II missile are constructed by casting them in halves and bolting them together with a minimum of machining required.

Chance Vought Aircraft approached the problem of fabricating these thin, critical-tolerance surfaces in two ways. Sections lending themselves to standard procedures are fabricated accordingly. As the section thins out, the surface is cast from magnesium in two halves to eliminate the expensive cores, and fastened.

Machining is required only on one face of each casting. Use of a vacuum chuck precludes any machining of contour. This deforms the casting into chuck contour and the operation is performed. When released from chuck, any small spring is of little consequence as the hi-shear bolts will pull halves into contact.

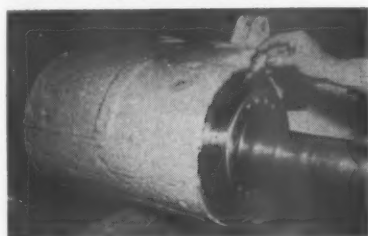
Hi-shear blind bolts, used at intersection bosses, have good pull-up, tension and shear properties and hold the two castings tightly together. Deutsch blind rivets are



used at the intermediate bosses.

This construction is good temperature-wise to Mach 2.

ROLLER BEARINGS LOCKED WITH LIQUID SEALANT



By mounting the roller bearing in the jaw of a rock crusher with a slip fit and liquid sealant, the Acme Road Machinery Co. of Frankfort, N.Y. saved time and \$155.

Previously, the 9" bearing was assembled with an interference press fit requiring three to four days delay. American Sealants' Loctite does the work in less than an hour.

Now, Acme uses a clean rag to wipe the O.D. of the bearing and I.D. of the housing, roughens the mating parts with emery paper, applies the sealant to both surfaces and assembles the bearing with a light push fit (clearances .0003"). The bearings have been submitted to severe shock, without report of failure, in the crusher which reduces rock up to 10" x 20" to aggregates from 1/2" to 1 1/2".

SMALL FASTENERS USED IN LARIAT ASSEMBLY

When the Flexigraph Co. invented the Hoop-A-Lariat, a length of flexible plastic tubing combined with a few links of ball chain, Stanley-Humason, Inc., of Forestville, Conn. was given the contract to manufacture and assemble the toy.

It was done by slipping bead chain in the adjoining ends of two sections of hollow plastic tubing, clamping the chain within the plastic with tiny retaining rings. Another metal band was clamped onto a loop of the plastic at one end of the one section. With a lariat loop formed, the opposite end of the second section was hitched around the hoop and back through the loop to form a flexible pivoting handle.

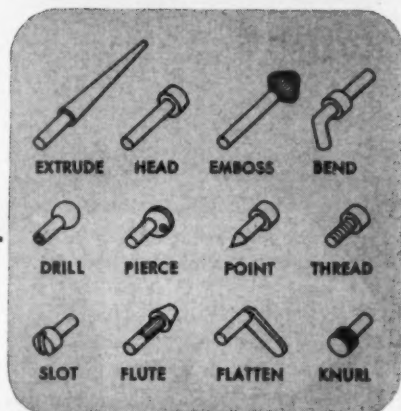
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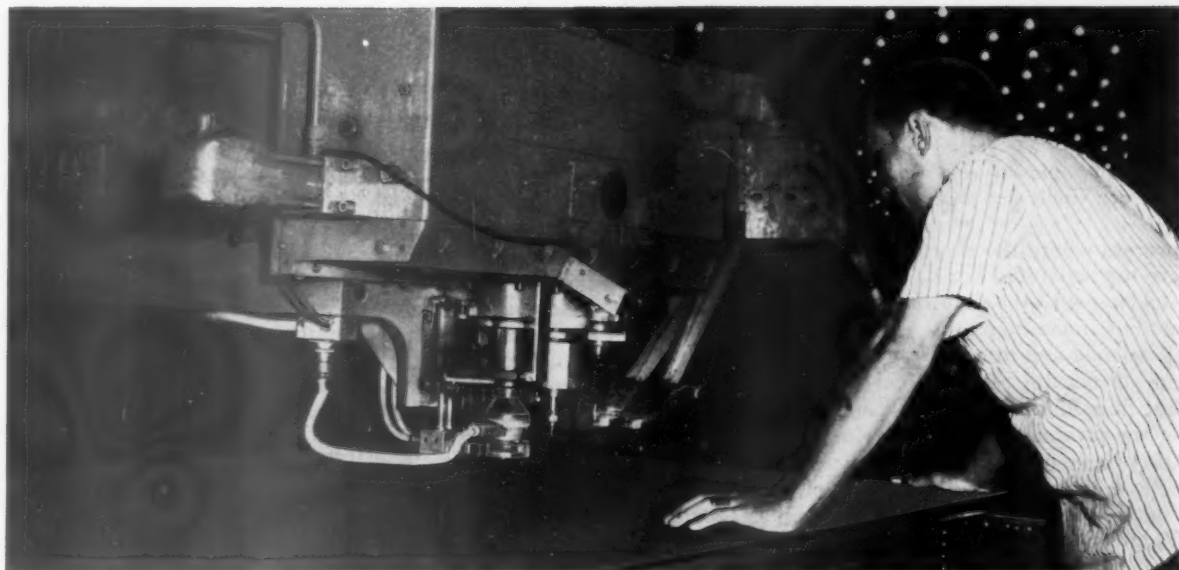
by **Hal Booth**
Facilities Engineer
Long Beach Division
Douglas Aircraft Company

AUTOMATIC RIVETER MODIFIED FOR HOT DIMPLING



*Special hot dimpling
dies installed on a
riveter at Douglas
Aircraft have re-
duced production
time on large ri-
veted panel sections
by about 50 percent*

*Many of the large panel sections of
the new Douglas DC-8 jet airliner were
made by methods described in this article.*



Left side view of the modified riveter head, showing the hot dimpling dies closed upon the workpiece. After hot

dimpling, the riveter head shuttles toward the left, bringing the drill (at right of dies) into drilling position.

Company-designed hot dimpling dies installed on a modified Drivmatic riveter at our Long Beach, California, division reduced production time on large riveted panel sections by 50 per cent, while boosting the quality of the work turned out an estimated 75 per cent. This is a long step forward in an industry where, since the first metal-skinned airplane took to the air, the tedious job of hand-installing multiple thousands of rivets has always been a production bottleneck.

When using the modified riveter, the sheets and stringers to be assembled are first clamped in a holding jig or table under 1000-1500 lbs. pressure so that they will not slip or move during the operational cycle. Then as each riveting position moves under the head of the riveter, the head shuttles automatically through three operations . . . first hot dimple, then drill, then insert and head up the rivet. An automatic control panel is set with a specified dwell and slow form time during which maximum heat is reached. Then the final coining of the dimple

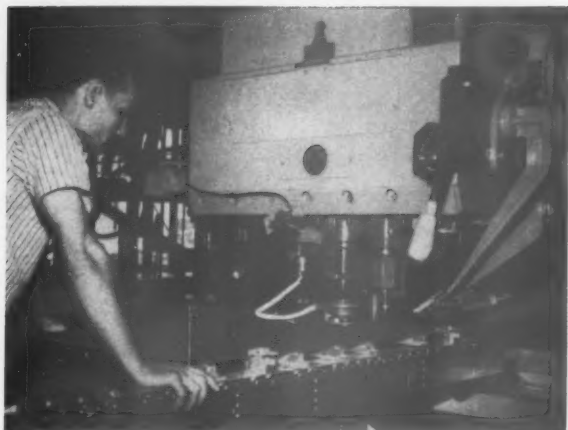
takes place. After forming of the dimple, the dimpling dies move out of position to permit the rivet hole to be drilled.

Exhaustive tests have proved that the hot dimpling temperatures employed have no permanent metallurgical effect on either the material being dimpled (generally 75-ST aluminum alloy) or the rivet which is inserted and headed up almost immediately after the hot dimpling operation.

Prior to the use of the modified riveter, material that had to be dimpled was first clamped together and drilled, then the sheet and stringer or hat section were separated, the drill holes deburred, then the sheet was dimpled on one machine and the stringer on another. Then the sheet and stringer were re-matched and hand riveted. This degree of separate handling not only consumed time, but no matter how carefully it was controlled, it often caused "puckering" to occur between the hand driven rivets, with a resultant drop in work quality. This puckering never occurs in the new hot dimpling

continued

Riveter Modified for Dimpling, continued



View from the right hand side. Here again the hot dimpling dies are closed upon the workpiece. The rivet feed chute and the ram which descends to head-up the rivet are visible just to the right of the drill.

process where the sheets and stringers, once mated, are not separated again.

Along with the required Drivmatic riveter modifications, an automatic electronic control panel was developed and integrated with the riveter in a manner to control all machine operations pertinent to hot dimpling. The control panel prevents operation of the riveter until the dimpling dies have reached the proper dimpling temperature. This dimpling die temperature, selected from a chart, is pre-set on the control panel, and may vary as much as 150 degrees F. for different rivet sizes and different material thicknesses. The panel also controls the dwell and slow form time (ranging from $6\frac{1}{2}$ to 8 seconds) of the hot dies on the material before pressure is applied for forming the dimple.

The steel dimpling dies now in use are electrically heated. Both the male and female die have their own heating elements, which are automatically controlled by the electronic panel. The lower female die remains in an elevated position through the riveting cycle and acts as the rivet anvil during rivet heading. The upper or male die has a very small protuberance at its very center or apex. This protuberance literally "center punches" the dimple, and the small indentation it makes acts to guide the drill through the exact center of the dimple during the subsequent drilling operation.

The original G39A-60 Drivmatic had a 6-inch stroke on its lower ram. This was replaced with a compound cylinder type lower ram with a 13-inch stroke. The two element head (drill and rivet) on the original machine was replaced with a three element head (dimple, drill, and rivet).

The dimpling ram itself carries the male die and will exert up to 20,000 lbs. of pressure. The stroke of this ram is controlled in 3 phases. When the ram descends in its first (or rapid approach) phase, it continues until a mechanical valve is operated, which reduces its speed to phase 2 (or slow form) speed. The slow form continues for a predetermined dis-

tance at a controlled rate of speed. When a second predetermined position is reached, the third phase or coining force of the dimple cylinder is applied. The signal indicating that this second position is reached is by closure of a micro-switch contact. The rate of speed during the slow form cycle is controlled by the setting of a calibrated hydraulic flow control valve.

The final 20,000 lbs. pressure is obtained by applying an intensifier to the hydraulic circuit at the second ram position. This intensifier (or injector) is provided with a calibrated mechanical stroke control so that the quantity of injected fluid may be varied for a precise degree of coining. A limit switch on the injector stroke signals completion of this phase of the machine cycle.

DIMPLING MOTION IS IN UPPER HEAD

While this operation is in process, the lower ram which carries the female die has been extended to bring the female die into contact with the underside of the work piece and to hold it there during the entire dimpling cycle. Therefore it is evident that all of the dimpling motion is in the upper head or on the male die, and it does not require any vertical motion of the work piece to form the dimple.

Upon completion of its stroke, the dimpling die retracts to its full elevation and at the end of this stroke, signals the transfer to drill. The drill ram is then moved into its operating position.

The drilling ram consists of a hydraulic cylinder similar to the one now existent in the model G39A riveter. It differs only in that it contains an air motor to rotate the drill bit during the drill cycle only. The feed mechanism also differs from the standard in that a mechanical valve cuts in the controlled feed. When the drilling descends to a mechanical stop, a pressure change occurs in the hydraulic circuit which signals the drilling ram to return. Upon returning to its full elevation, it signals the transfer to rivet and the rivet ram shuttles into its operating position. The riveting ram in itself is identical to the original equipment.



Micro-photo of sectioned rivet installed by hot dimpling process. Note flushness of rivet head with surface, and how well the rivet was formed in dimple and drilled hole.

The operation of the 13-inch stroke compound cylinder type lower ram is best described by following it through a complete cycle of operation.

1. Rises to press the clamp sleeve against the underside of the work piece.

2. Continues to rise until the upper surface of the female die is in contact with the underside of the work piece and remains there throughout the riveting cycle.

3. During the transfer to drill cycle, the ram descends to its drill clearance position, but will retain clearance pressure on the work piece.

4. After the drilling has been completed and the rivet has been inserted and held down by the bucking cylinder, the lower ram rises again to form the rivet. (At this point, the female die serves as the rivet anvil.) Control of rivet height is obtained through pressure sensitive switches which will control the force exerted by the lower ram. Tests have proved that very accurate rivet height can be obtained by this method.

More data on the modified riveter is contained in the specification sheet herewith. While it would be foolish to claim that this tooling job was a simple one, we at Douglas feel that the results we are obtaining justify all the work involved. •

SPECIFICATIONS OF THE MODIFIED RIVETER

Throat Depth: 60 in. Work Height 53 $\frac{3}{8}$ in.

Dimpling Ram

- Force: 20,000 pounds
- Approach: Uncontrolled rate maximum velocity to a predetermined (adjustable) position.
- Slow Form: Rate variable for a predetermined travel in a predetermined interval.
- Final Form: Uncontrolled rate maximum velocity at maximum force to end of stroke.
- Return: Uncontrolled rate maximum velocity.

Drilling Ram

- Approach: Uncontrolled rate maximum velocity to predetermined adjustable position.
- Feed: Rate variable.
- Return: Uncontrolled rate maximum velocity.
- Drill Size: Maximum $\frac{1}{4}$ inches.
- Drill Speed: 14,000 rpm, approximately
- Power: 1.2 hp (90-100 psi air pressure)

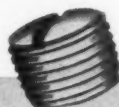
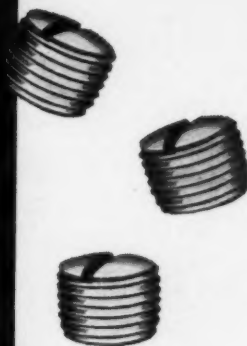
Hydraulic System

- Pump Motor: 7.5 hp.
- Capacity: 11 gpm at 1000 psi.

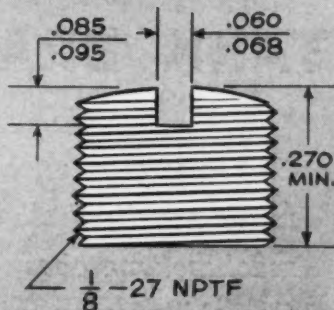
Pneumatic System

- Local Accumulator Capacity
- Air Line Requirements: 50 cfm at 95 psi.

SHORT PIPE PLUGS



Dimensions shown are for standard $\frac{1}{8}$ " Short Pipe Plug widely used by makers of electric motors. Note low crown and threads carried completely to crown. ELCO also makes all sizes and types of regular Pipe Plugs in various materials.



NOW MANUFACTURED BY COLD HEADING PROCESS



The advantages of the cold heading process have now been adapted to the production of $\frac{1}{8}$ " Short Pipe Plugs, formerly made only by another method. Cold heading produces a stronger plug, of uniform strength throughout.

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Cold heading also brings lower costs. Get our prices — compare with your present source! Another important feature — Elco Pipe Plugs are made with the "Dry-Seal" thread that eliminates sealing compounds and, when properly mated, will not leak at pressures up to 250 psi.



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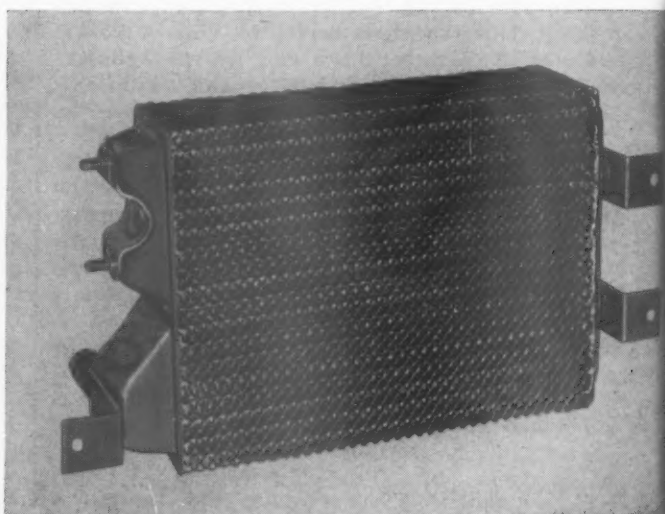
AUTO HEATER TANK BRAZING

One operator with an automatic gas-fired silver brazing machine matches output of five skilled men with torches

by Paul Ciespy
Production Superintendent
Heater Division
Blackstone Corporation

An automatic gas-fired silver brazing machine has cut costs and improved joint quality of an assembly for auto heaters manufactured by the Blackstone Corporation, of Jamestown, New York.

One man produces as much with this machine as five men did by the old hand torch method. Production keeps pace with other production factors and quality has improved to the point where there are practically no rejects or rework.



The oldest builders of household laundry equipment (since 1874), and one of the first to build a successful automatic washer, Blackstone has also been a supplier to the automobile industry since 1914. Since then the company has been a major supplier of radiators and heaters to many of the leading auto makers.

In assembling complete auto heaters, one of the difficult problems was the solder assembly of a top tank for the heater core. This was performed as a hand soldering operation, expensive and slow. Labor costs and rejects due to leaks were high, adding additional inspection and rework costs.

TAKES LESS SPACE TO BRAZE MORE PARTS

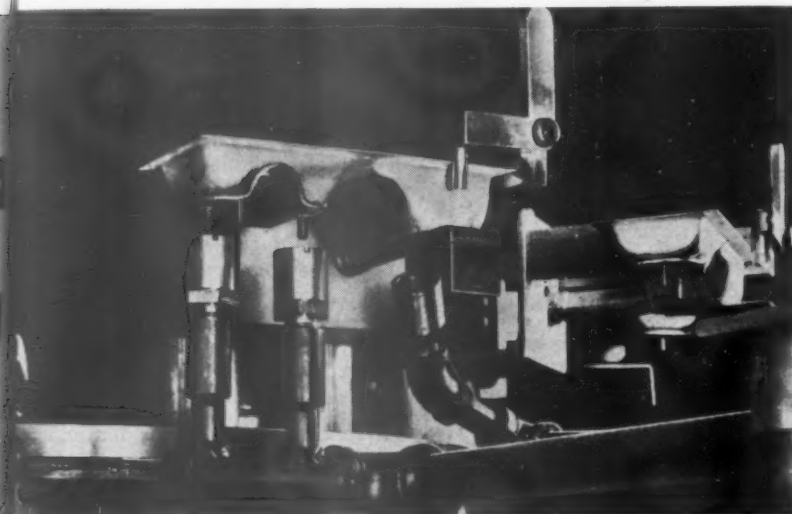
Blackstone solved this problem by installing a Selas nine-station self-indexing, automatic brazing machine. It takes up a floor space of only 5 by 5 feet—much less than the previous method.

The top tank is a sub-assembly of the heater core. It is made up of 0.025 in. thick brass stamping, a piece of

Below auto heater tank is in heating station of nine-station self-indexing brazing machine. Blackstone makes use of preformed rings and other shapes of brazing alloy to assure optimum quantity of filler in every joint.



One man with automatic brazing machine produces as many auto heater assemblies at Blackstone's Jamestown plant as five men did by former hand-torch method. An identical machine at their plant in Stratton, Ontario, performs the same function using propane instead of natural gas.



brass tubing $\frac{5}{8}$ in. o.d. by $2\frac{1}{2}$ in. long, and a copper-plated steel clamp with two copper-plated steel studs. The tube is silver brazed with Sil-Fos No. 5 into the side of the tank and the two studs are brazed through one end of the tank and pass through the clamp. The studs are later used to secure the heater core assembly to the automobile hot water system. After the assembly of tanks is completed, they are soldered to the heater cores in an automatic solder dip.

USE PREFORMED RINGS OF SILVER SOLDER

Tanks with studs and brackets in place are brought to the brazing machine in skids, while tubes are brought in shop pans. An operator places a tank in a fixture attached to the indexing table. He then places a preformed ring of silver-soldering material on the tube, dips this in flux and places it in a hole in the tank. The machine then automatically indexes and the operator repeats the loading process.

The machine has nine stations. The first station

is a loading station; the next two are waiting stations; the next three are brazing positions; the seventh and eighth stations are the cooling stations and the ninth is the automatic unloading station.

PRODUCES UNIFORMLY BRAZED JOINTS

The automatic operation of the machine assures uniformly brazed joints by stabilizing all significant variables.

Natural gas and air are mixed to stoichiometric proportions and the mixture is pressurized by a Selas gas combustion controller. This gas-air ratio, once set, need not be adjusted again in normal operation. The fixed ratio and pressure of the fuel mixture provide a standardized combustion at the burners. Since each assembly is exposed at a fixed distance from the burners for a fixed time, the optimum heating cycle is established once for each tank assembly design. It is reproduced thereafter without error.

continued

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The **RIGHT** rivet, plus the **RIGHT** riveting machine will produce a fastened assembly at the **RIGHT** low cost

The correct combination of rivet and machine requires expert knowledge available to you through Chicago Rivet engineers.

Anticipated production, type of materials to be fastened, assembly shape and its expected service life are factors to be considered. Decisions must be made on a rivet metal or alloy. Type and size of rivet, shape of head and shank, depth of tubular section must be all determined. Are indexing fixtures and multiple setters indicated? Can a standard rather than a special rivet be used? These are the type of questions Chicago Rivet Engineers are daily answering for industry. Their recommendations are available to you without cost. We suggest you send a blueprint or sample assembly with your inquiry.

There are
Chicago Rivet
Machines that will set

- 1 !
- 2 !!
- 3 !!!
- 4 !!!!
- 5 !!!!!
- 6 !!!!!!

Tubular or Split
Rivets At a Time

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Branch Factory: Tyrone, Pa.

FOR YOUR FILES
Rivet catalog describing
1388 standard tubular
and split rivets
and 26 single and
multiple automatic
rivet setters.



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Auto Heater Brazing, continued

Although it is not necessary to the function of this type of machine, Blackstone makes use of preformed rings and other shapes of brazing alloy to assure the optimum quantity of filler in every joint.

AUTOMATIC EJECTION

From the ninth station, the assembly is automatically kicked out of the indexing fixture on to a chute that transfers the top tank—still at an elevated temperature—to a basket in a slightly acid water solution where the assembly is cleaned. After the basket is full it is dipped in a rinse and allowed to drain dry. The assembly is then taken to a bright dip, and subsequently soldered to the core.

Although the design of this machine was based on an investigation of this specific application in Selas process development laboratory, the machine is inherently versatile. Changes in material and design, required by the fast-changing needs of the automotive industry, are accommodated by simple changes in burners, burner placement and timing.

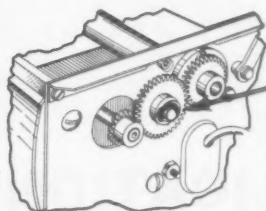
QUICK FUEL CHANGES

Fuel changes can be accommodated as easily. An identical machine at Blackstone's Stratford, Ontario, plant performs the same function using propane instead of natural gas.



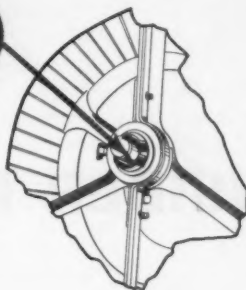
Truarc Rings Eliminate Parts and Machining, Speed Assembly, Reduce Manufacturing Costs

Ring eliminates nut and threading, saves \$365/M



Sanborn Co., Waltham, Mass., uses a Walde's Truarc Series 5555 Grip ring* to secure the idler gear assembly of its portable electrocardiograph. The ring assures faultless gear performance necessary for diagnostic accuracy, eliminates a nut and threading operation for savings of \$365 per 1000 units.

Ring saves parts, speeds assembly for savings of \$260/M



Fraser and Johnston Co., San Francisco, Calif., uses a Series 5555 Grip ring* to secure the fan shaft and speed assembly of its furnace blowers. The ring eliminates a collar and setscrew for savings of \$180/M on materials, \$80/M on assembly time—a total of \$260 per 1000 units.



2 standard rings replace
4 special parts, save \$170/M

Sanymetal Products Co., Inc., Cleveland, O., uses a Series 5005 Self-locking ring and a Series 5103 Crescent® ring* to hold the escutcheon plate and handle of this doorlatch for toilet compartments. The two standard rings replace four expensive chrome-plated brass parts for savings of \$170 per 1000 units.

Ring replaces spring and washer;
speeds assembly 50%, saves \$15/M



Allen-Bradley Co., Milwaukee, Wisc., uses a Series 5139 Prong-Lock ring* to secure the adjustment knob of its pneumatic timer. Ring eliminates a costly coil spring and washer, simplifies a tough assembly operation. Cost saving: \$15 per 1000 units. Assembly time saving: 50%.

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AFE-19



by **Ralph S. Battles**, President
Judson L. Thomson Mfg. Company

LET'S CONSIDER RIVET APPLICATIONS

A discussion of the relative merits of six standard rivet types: semi-tubular, tubular, bifurcated, shouldered, outside prong, and compression

Today, rivets are being produced to thousands of print specifications. Their uses range from bridge tables and folding chairs to jet aircraft and orbiting satellites. And since fasteners and fastening are a continuing problem for design engineers, a description of the basic types of rivets, their functions and relative merits seems called for.

There are six standard classifications of rivets: semi-tubular, bifurcated (or split), shouldered, tubular (or deep-drilled), outside prong, and compression. Each type has been designed to obtain certain advantages for specific purposes.

SEMI-TUBULAR RIVETS HAVE HIGH STRENGTH

The semi-tubular rivet combines the high shear and compression strength of solid rivets with low-cost, high-speed fastening. Shallow holes in solid shanks distinguish semi-tubular rivets from other types. The hole is seldom deeper than the shank diameter. Its depth is determined by clinch requirements of specific applications.

A general rule is to select a rivet with length equal to the thickness of the materials to be fastened plus 55 percent of the diameter of the shank. Materials commonly fastened by semi-tubular rivets are metals, plastics, wood, ceramic and other hard materials.

The size of the prepared holes is an important design consideration. When holes are too small, rivets choke; when too large, rivets buckle. To avoid both, design engi-

neers specify that each hole be about 7 percent larger than the maximum shank diameter of the rivet. In most cases, the setting process causes shank expansion sufficient to fill the hole.

The second basic type is the bifurcated (or split) rivet. This type of rivet provides self-piercing permanent fastening for high-speed assembly of light gauge metals up to .040" thick, woods fibre, leather, canvas, and plastics.

Use of bifurcated rivets not only eliminates the delay and cost of pre-punching or pre-drilling holes, but also prevents weakening assemblies through removal of material. They can be applied by high-speed automatic rivet-setting machines, which can be operated by unskilled help.

Bifurcated (or split) rivets are clinched by anvils that spread the prongs flush with the surface, turn their prongs into material, against burrs, washers, or inside caps. The latter two methods are specified when a stronger bearing surface is required. The use of caps improves assembly appearance by giving uniform appearance to both ends of the rivets.

Among users of bifurcated rivets are manufacturers of sheet metal products and assemblies, can-

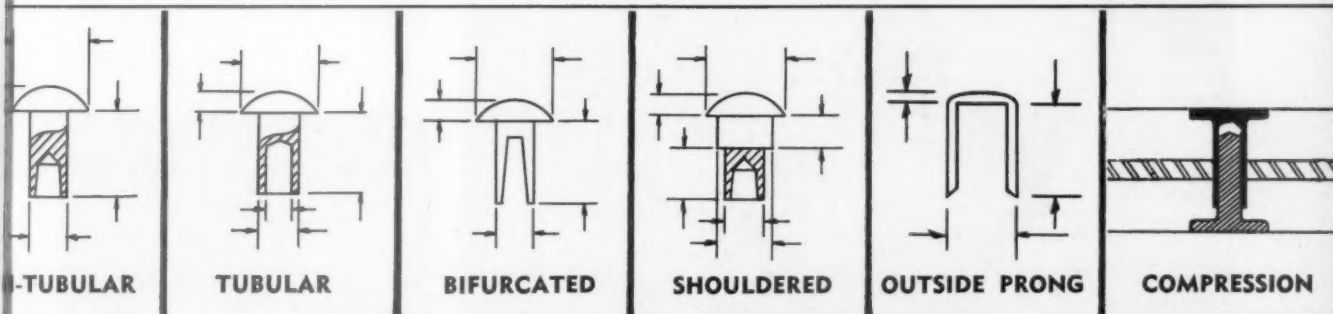
with low-cost fastening. These low-cost, high-speed fasteners should be thoroughly investigated in the design stage of new products.

Hole sizes in pivoted assemblies should allow clearance of .002" minimum. Shoulder lengths also enter pivoted assembly design. Where clearance of pivoting sections is important to prevent friction and wear, shoulder lengths should be at least .005 inch greater than the maximum thickness of the upper section.

It pays to think twice about shouldered rivets when design and production considerations seem to prevent insertion of the rivet-setting machine's driver or anvil for clinching the rivets. In many cases, a slight change in spacing or cavity size allows use of rivets without changing over-all dimensions. In other cases a change in assembly sequence permits a profitable switch to machine-set rivets.

Current users include manufacturers of automatic parts and switches, baby carriages, car beds and seats, jalousies and aluminum windows, rollaway beds and vending machines.

Deep-drilled rivets are used for low-cost, permanent fastening of leather, plastics, rubber, wood,



vas bags, dog collars and harnesses, golf bags and shoes, handbags, leather goods, luggage, raincoats, sporting goods and tote boxes.

SHOULDERED RIVETS CAN DOUBLE AS PIVOTS

For permanent fasteners which can double as pivots, industry turns to shouldered rivets. They are cold-headed when radii in corners and at edges are not critical and dimensional limitations permit; otherwise cold-heading is supplemented by secondary turning operations.

Like semi-tubular rivets, they have shallow, punched or drilled holes in their shanks to combine the shear and compression strength of solid rivets

canvas and other easily-pierced compressible materials. They are used to replace or reinforce stitching.

These rivets eliminate the cost of pre-punching or pre-drilling holes in materials. Drilled to a depth up to 1/2", they punch their own holes through the material and compress it within their hollow shanks.

The depth of standard deep-drilled rivets always exceeds shank diameter, but seldom exceeds 1/2". Exact depth is determined by the compressibility of materials to be fastened and by the clinch requirements of the application. A rule of thumb is to add shank diameter to the thickness of the compressed assembly. The safe rule is to have a test run on actual samples.

continued

For deep-drilled rivets, as well as bifurcated, semi-tubular and shouldered rivets, the average head diameter ranges between 1.75 and 2.75 times shank diameter for rivets produced by single-blow heading machines. Head diameters up to $3\frac{1}{2}$ times shank diameter are possible. The shank diameters of standard sizes range from .040" to .320". Head thickness ranges from 0.3 to 0.6 times shank diameter, depending on the head shape.

Two different clinches are possible with deep-drilled rivets, depending on application and metal used in the manufacture of the rivets. One is a roll clinch; and the other, a scored clinch. Roll clinch, produced by correctly-shaped anvils (either solid or spring pilot type), is stronger. Scored clinch is specified when clinch must be turned into the surface of the work. Manufacturers of leather goods, luggage, shoe skates, baseball shoes, camera cases, handbags, golf bags, and other sporting goods are heavy users of deep-drilled rivets.

The fifth basic type is the outside prong rivet. The term "outside prong" is applied to special rivets stamped from sheet metal. Two or more prongs ex-

tend from the edges of their heads. Their appearance seems to suggest "two-legged tacks" or "headed staples."

These rivets are used as very low-priced, self-piercing fasteners for assembly and/or decorating such easily pierced materials as thin leather, fabrics, light fibre-board and light plastics.

Since they form their own holes by displacing material instead of removing it, they eliminate delay and cost of pre-punching holes and also avoid weakening the material.

They may be clinched inward or outward depending on the setting machine's anvil. The outward clinch is stronger.

Some specific uses of outside prong rivets include attaching cords to radio tuners, fastening and decorating dog collars and harnesses, securing loops on men's belts, decorating women's dresses, attaching rings on easels of picture frames, strengthening baskets, fastening and decorating a variety of leather and plastic products, strengthening dungarees and decorating holsters and chaps.

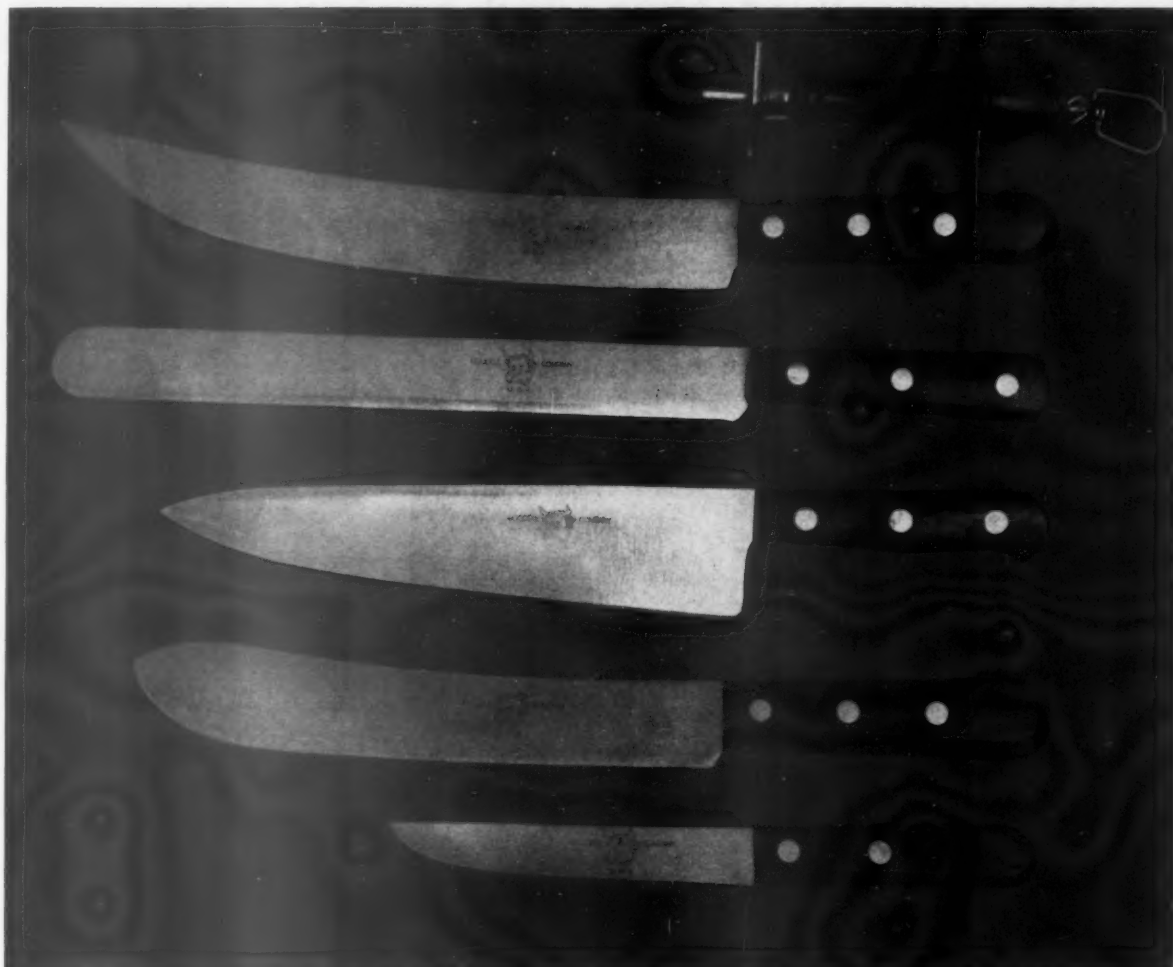
Compression or cutlery rivets are made in male



At left is an interesting application of a double-headed machine for setting tubular (or deep-drilled) rivets. These rivets punch their own holes through the material being fastened, and compress it within their hollow shanks.



Here is a finished piece of luggage, containing many tubular rivets, at the end of the assembly line at the American Luggage Works, in West Warwick, Rhode Island.



Compression rivets are made to fit snugly in counter-bored holes to provide a smooth and projectionless sur-

face. A typical application is found in this cutlery made by the Goodell Company, of Antrim, New Hampshire.

and female pairs. Each pair consists of one solid rivet with chamfered shank and one deep-drilled rivet to match. They are made to fit snugly into counter-bored holes, and provide a smooth, projectionless surface on the product. They are cold-headed from aluminum, brass, nickel, silver and steel. Their most common use is as fasteners for cutlery handles. Secondary uses of compression rivets are as hinge pins on utensil lids such as coffee pots and for securing handles and covers to cookware.

In addition to the standard rivet types, there are metal caps which, in conjunction with bifurcated or tubular rivets, may be used in place of compression rivets when the designer is seeking an assembly with neat lines and smooth surfaces. Pre-punching or drilling can be eliminated. By clinching the rivet inside a cap which looks like the head of the rivet, these desirable effects are secured. Also, a greater bearing surface is provided by the caps.

These caps are made of steel and brass in diameters ranging from $\frac{1}{4}$ to $\frac{9}{16}$ " with flat or concave backs. They can be color-finished to match the rivets. The clinch strength of caps depends on the rivets

with which they are used. The scored clinch of deep-drilled rivets is much stronger than the two-legged clinch of split rivets of the same diameter.

SPECIAL PRECIOUS METAL RIVETS

Rivets are also used in the electrical field where high conductivity and resistance to corrosion are demanded. This is achieved by the use of precious metal rivets as contacts in electrical and electronic equipment, and aviation and automotive components. Such rivets are made from silver, sintered silver cadmium oxide; silver and copper; silver, cadmium and nickel; pure palladium and silver; gold, platinum and irridium.

Most common shapes used in precious metal rivets are oval, flat countershank, ideal and button. Head diameter, as a rule, is between 1.75 and 2.75 times shank diameter and head thickness between 0.3 and 0.6 times shank diameter. The shank types of precious metal rivets are solid and chamfered, spot shank and semi-tubular. They are made in high speed production to tolerances approaching those of machined parts, plus or minus 0.001 inch. •

To every user of threaded fasteners:

SPS Thread Metrology Labs will help you

- Analyze and eliminate thread fit problems
- Establish more reliable gaging techniques
- Check and set inspection gages accurately

As part of a continuing program to help threaded fastener users meet today's demand for increased product reliability, SPS has opened Screw Thread Metrology Laboratories at three key points across the country. The three identical facilities make available to you the advanced gaging techniques, precision measuring machines, and screw thread technology employed by SPS itself. These laboratories are located at:

Jenkintown, Pa.—Just north of Philadelphia, SPS headquarters plant, Highland Ave.

Phone: TUrner 4-7300

Cleveland, Ohio—At the plant of Cleveland Cap Screw Co., an SPS Company, 4444 Lee Rd.

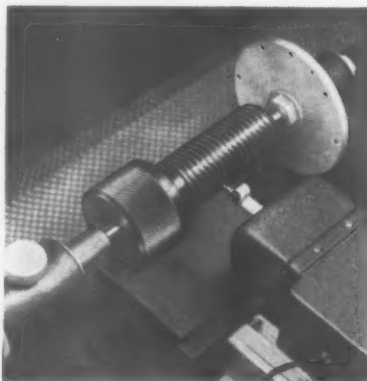
Phone: LUdlow 1-3000

Santa Ana, Calif.—SPS Western 2701 S. Harbor Blvd.

Phone: KImberly 5-9311

Basic services of the new SPS Metrology Labs include analysis of fastener fit prob-

lems; checking and setting of screw thread inspection gages with highly accurate equipment; and setting up of reliable thread inspection methods in conformance with recognized standards. In addition, these SPS facilities will



ELECTROMECHANICAL LEAD TESTER. Checks from 4 to 80 threads per in.; lengths to 4 in.; diameters to 8 in. Precision: .00001 in.

serve as a clearing house for the latest information on threaded fasteners.

Each laboratory—a showplace of modern measuring equipment—is temperature and humidity controlled to insure the reliability of its instrumentation. Each has complete equipment for precision measurements of all screw thread elements—major, minor and pitch diameters, half-angles, lead, radii, etc.; for gage setting; and for inspecting thread forming tools themselves if necessary. Equipment at each location includes electromechanical measuring machines for determining thread dimensions to the nearest one hundred-thousandth (.00001) inch; primary reference standards, of even greater precision, for calibrating these machines; optical comparators for studying screw thread profiles enlarged 100 times; and profilom-

eters that measure surface smoothness as close as one millionth inch. This and all the other equipment will be devoted especially to measurement and inspection of the following classes and types of thread:

Unified Screw Threads—Class 3A, 2A, 3B, 2B; National Standard Screw Threads—Class 3, 2; Tapered Threads—ANPT, NPTF types. (Special thread types or forms can also be measured or inspected with the facilities of these laboratories.)

SPS believes that the services rendered by the laboratories will help fastener users set up or augment their own thread size control systems to eliminate misfits that might cause delays on the assembly line or compromise the reliability of finished products.

Fastener users are invited to put these laboratories to their service any time. Simply contact your SPS salesman or distributor or get in touch with the lab nearest you. And remember, whether you have any immediate fastener problem or not, a visit from you will be welcomed. Write for free booklet describing the laboratories in detail. STANDARD PRESSED STEEL CO., Jenkintown 78, Pa.

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SPS research is continually developing fasteners with higher standards of predictable performance. By installing SPS high-reliability fasteners in your assemblies, you increase overall product reliability.

For more information on the full meaning of reliability, write for a copy of the new SPS booklet "High Reliability."



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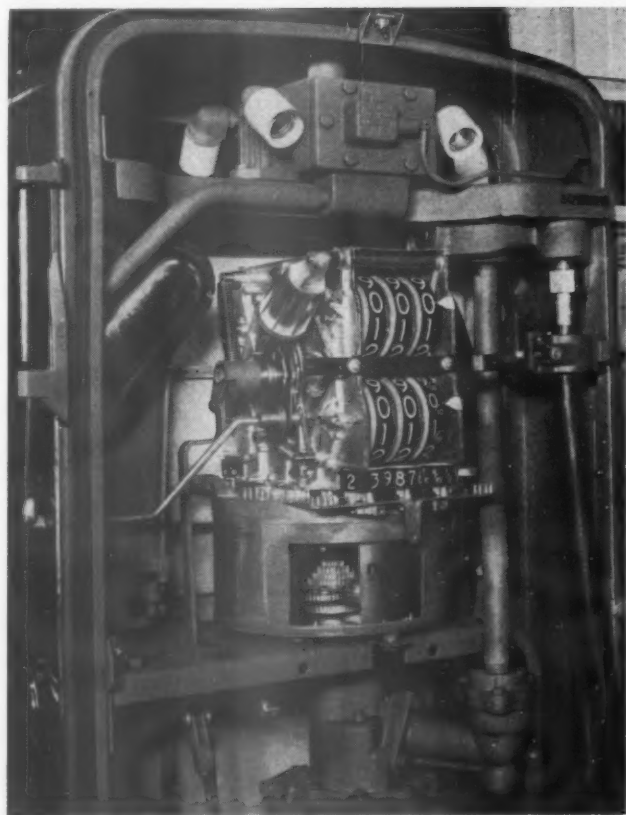
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by **W. P. Mitnik**, Manager
Production Engineering Dept.
Gilbert & Barker Mfg. Company

QUICK SERVICING FOR GASOLINE PUMPS

*Removal of panels from gasoline
pumps was made an easy task
with use of quick-release fasteners*



At top of this Gilbarco gasoline pump shell is bracketed receptacle for quarter-turn fastener which will lock the outside panel in position. Receptacle is mounted with machine screws.

Removal of panels from thousands of Gilbarco gasoline pumps throughout the world has been made a simple task with the aid of quick-release fasteners used to lock the pump panels.

Changing of gasoline prices requires that the panels be easily opened and relocked. And in the highly competitive gasoline field, special tools and complex fastening methods are a decided disadvantage. A suitable fastener for this job must be as simple as possible, and capable of being opened and relocked thousands of times without significant wear.

A FIVE-FOLD SEARCH

Historically, the Gilbert & Barker Mfg. Co., of West Springfield, Massachusetts, has been searching for some time for a fastener with the following requirements:

The pump must be easily opened and locked, without the need for special tools.

The fastener must be sealed to prevent foreign matter from entering the pump.

The fastener must resist the action of the elements and corrosive materials during the life of the pump.

The fastening action must be reliable for many thousands of cycles of locking and opening.

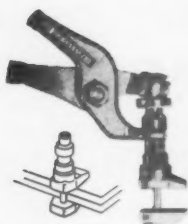
Finally, the unit cost must be relatively low.

To meet these requirements, a succession of designs was tried. These included the use of a remote control latch actuated by a choke wire, and a fastener located within a cavity in the pump and operated with a key. Because tens

continued

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● *fast-action clamps and fasteners*



EDGELOCK FASTENER

Spring actuated. Powerful grip (75 lbs.) Quick release. Holds material thickness up to 1" where no rivet holes are provided. Jaw depth $\frac{1}{2}$ ". Completely enclosed spring. Applied with hand or pneumatic pliers.



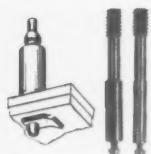
SHEET METAL CLAMPS

Cam trigger. Sets and releases with one hand in one operation. Holds material thicknesses up to $1\frac{1}{4}$ ". Jaw depths to 2". Nickel plated. Comes in many styles, with rubber jaws or sawtooth jaws.



SPRING ACTUATED FASTENERS

Fast alignment of rivet and bolt holes on lighter materials. Available in variety of types for #50 hole size to $\frac{1}{4}$ ". Material thicknesses up to 1". Fully enclosed spring. Small diameter body. Color coded. Applied with hand or pneumatic pliers.



SPEED BOLT FASTENERS

Wide variety of holding pins fit one standard fastener body. Precision ground. Each pin is adjustable in fastener to handle thicknesses up to 3"; hole diameters to .430. Holding tension up to 250 lbs. Applied with hand or pneumatic pliers.



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Fast alignment of rivet and bolt holes. Adjustable pressure. Several sizes. Handles thicknesses up to $2\frac{1}{2}$ ", hole diameters up to $9/16$ ".



DRILL STOPS

Controls drill penetration. Increases drill life. Prevents chuck from gouging material. Available for drill sizes up to $5/16$ " and lengths to $2\frac{1}{8}$ ". Special sizes on request.

Wedgeloock makes the greatest variety of speed clamps and fasteners in the country. For information, write to

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Quick Servicing for Gas Pumps, continued

of thousands of gasoline pumps were involved, these solutions were regarded as uneconomical and overly complex. Other types of fastening methods were looked into.

The final answer was a pair of standard Camloc quarter-turn fasteners (one for each face of the pump). Located at the top of the pump, the corrosion-resistant fasteners can be locked and opened with an ordinary screwdriver.

INCONSPICUOUS FASTENERS

This top-side location provides additional benefits. The fasteners are inconspicuous, and do not attract vandals during the hours when filling stations are closed. Moreover, miscellaneous corrosion products do not wash down the pump faces to leave unattractive stains.

To date, more than 50,000 gasoline pumps using these quarter-turn fasteners, have been providing satisfactory, trouble-free performance in the field whenever prices are changed.



At end of conveyORIZED assembly line, gasoline pump is ready for crating. Both outside panels have been secured in position with quarter-turn fasteners shown on topside.

Designing with Modern Socket Screws

SOCKET SET and cap screws are receiving wide acceptance in a tremendous variety of applications where good holding power is a requisite.

Made of the proper alloy steel, heat-treated to high strength levels, these screws permit maximum tightening torque to insure parts being held in proper position. Their positive drive characteristics, in combination with their "L" shaped keys, provide for easy assembly in awkward locations.

Help cut size, weight

The recent trend toward miniaturization has increased the demand for socket screws. In practically every field of endeavor, the tendency is to reduce size and weight wherever possible and still maintain adequate strength levels comparable to previous designs. High strength socket screws in these miniaturized applications are able to effect substantial size and weight savings, as shown in the illustrations. The miniaturization trend has also pushed the development of miniature socket screws.

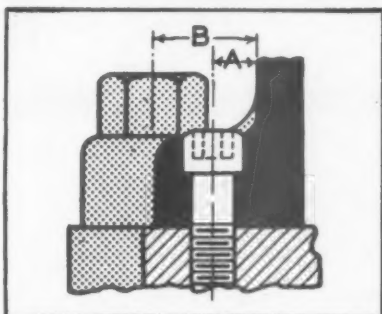


Fig. 1—How high-strength, heat-treated socket screws can save on flange over-hang. Dimension A, for socket cap screw design, is less than 50% of B for ordinary hex cap screw.

Stock screws as small as No. 0 (0.060" diameter) are now available for use in electronic equipment, radio, radar, and numerous other types of equipment.

An important size advantage to be gained in using socket head cap screws in machine assembly is the reduced size of the boss that may be used. The ordinary hex head cap screw requires a comparatively large boss because of the larger screw required and because of the clearance needed for the external wrench. The high-strength socket head cap screw permits the use of a smaller screw, and, because of internal wrenching, does not require additional clearance for the key.



Fig. 2—Recessed socket cap screws, as on the end plate of this automatic screw machine, increase safety by eliminating protruding screw heads on rotating surfaces.

Steps up safety

The use of hex or Multiple-Spline socket screw on rotating equipment is very advantageous from the machine designer's standpoint. When used with rotating equipment the screw may be completely recessed below the surface, thus eliminating any dangerous projections that might tend to catch on clothing. In addition, this convenient recessing feature permits cleaner, more streamlined design on new equipment than ordinary hex cap screws.

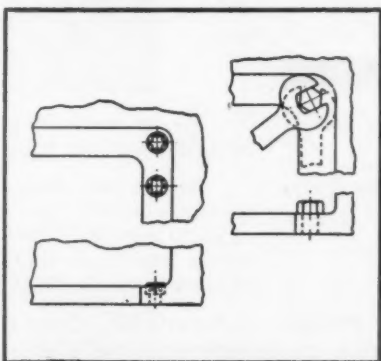


Fig. 3—When a screw is to be placed in a walled corner, a socket screw (left) need only clear the wall because of its internal wrenching. For conventional hex cap screw (right) wrench clearance is determining factor.

Simplifies jig, fixture-design

Jig and fixture design can also frequently be simplified and made more efficient with socket head cap screws. An obvious benefit is the elimination of any protrusions that might cause interference in use. When the heads of cap screws are recessed below the face of the die, clearance between punch and die can be reduced to an absolute minimum.

These are just a few of the ways that modern socket screws can help solve design problems—giving you high-strength and extra compactness in an almost unlimited variety of styles and sizes.

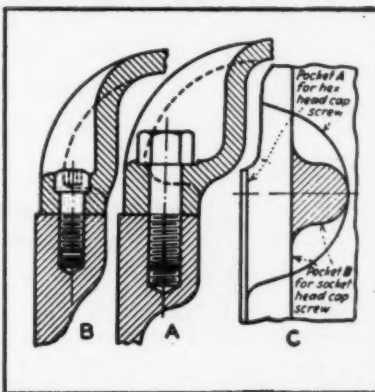


Fig. 4—Smaller, neater pockets are possible for corner fastening with socket cap screws than with externally wrenching hex cap screw.

Bristol offers a complete line of socket screws, manufactured to highest quality standards both set and cap, both industry-standard hex and Bristol-originated Multiple-Spline sockets. Sizes range from No. 0 (0.060" diam.) to 1 1/2" diameter, in alloy steel, in an extremely wide variety of standard lengths and styles. Socket cap screws to 3/8" diameter and set screws to 1/2" diameter are available in stainless steel. Ask your authorized Bristol socket screw distributor about these precision, high-strength socket screws today. He can give you sound advice on your socket screw problems as well as fast action on your orders.

A.B.1

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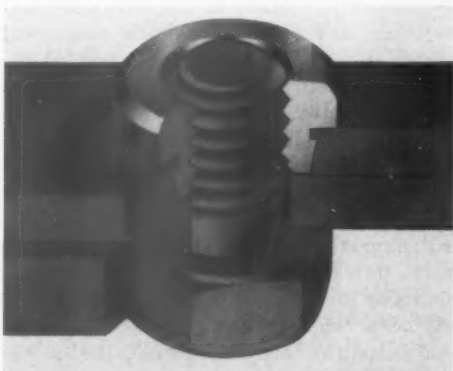
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HARDENED PLUG NUTS SAVE TAPPING

They lock automatically and provide ample thread length for secure fastening. Repeated removal of screws in service does not impair threads.



Plug nut showing the taper and its serrations, the latter being separated from the flange by a circumferential groove.



Here is a plug nut locked in a thin sheet against which a thicker sheet is clamped by a screw. The pull is against the head of the nut.

by William E. Long, Engineer

Attention to details of fastening is of great importance in uncounted products partly because, if fastenings loosen, the products may fail to function or give rise to endless troubles. Ease and speed in applying fastenings, as well as moderate first cost, demand consideration because they affect over-all cost, but, if savings decrease serviceability, the means used may be open to serious question.

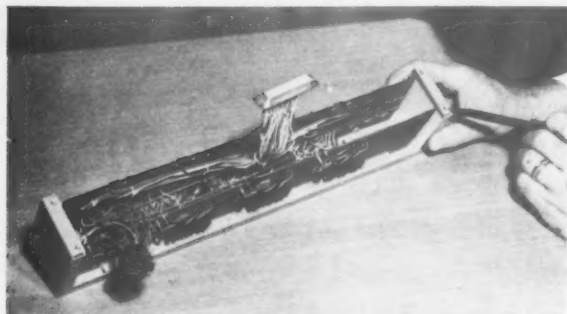
Among fastenings recently developed, "plug nuts," produced and marketed by The Lamson & Sessions Company, Cleveland, Ohio, possess several significant and noteworthy features, as examples of applications here cited indicate. These nuts are circular and are cut from bar stock on high speed screw machines. Their precut threads, produced by tapping, are greater in length than thickness of sheet stock in which the nuts usually are applied.

APPLIED WITH SIMPLE TOOLS

Each nut has a tapered projection beneath the head which is serrated. These serrations (or knurls) bite into the wall of the hole into which the nut is pressed or driven, locking the nut securely without any clinching operation and without affecting the flatness of the sheet. During application, some metal displaced from the hole flows into a circular groove between the large end of the taper and the head of the nut. This helps to hold the nut in the hole and prevent rotation. As the nut is case hard-

continued

Presenting applications of nuts with tapered projection which bites into wall of hole into which nuts are pressed or driven



This electronic chassis is fastened to its mounting panel by screws entering nuts inserted in holes in the corners. These nuts are in blind locations during final assembly.

ened, holding strength is increased and is high.

Application is very simply made, in any hole of proper size that has been punched or drilled in the sheet. Often, several nuts can be pressed into several holes at the same time, using a simple hand or power press. Alternately, a hand hammer used with a punch can be employed to insert nuts one at a time. Since the tapered end of each nut is always slightly shorter than sheet thickness, there is no protrusion on one face of the sheet. The head end of the nut, bearing against the opposite face of the sheet, stands out to a height about one-half the height of other types of preplaced solid body nuts.

Screws applied to plug nuts enter from the flush side of the sheet, through whatever part or other sheet (of any thickness) is to be fastened. When the screw is tightened, the head of the nut takes the pull. Any tendency of the nut to turn is resisted by the serrations, hence there is no need to hold the nut while assembling the screw. In fact, plug nuts are useful in blind locations not accessible to any tool, making the nuts especially useful in such applications.

FASTENING RELAYS TO CABINET WALLS

A typical application is in cabinets used by a maker of combustion control equipment. Relays and other components are fastened to the inside of the back wall, which is 0.050 in. thick. The cabinet back usually is mounted against a wall or other flat surface, and nuts are inaccessible after the cabinet is mounted. Forty to fifty plug nuts having 8-32 threads are driven home in the back of the panel with a hand punch, entering holes previously drilled for



A punch and hammer are used to force plug nuts into back wall of a control cabinet against a backing. When cabinet is in service, these nuts are in a blind location.

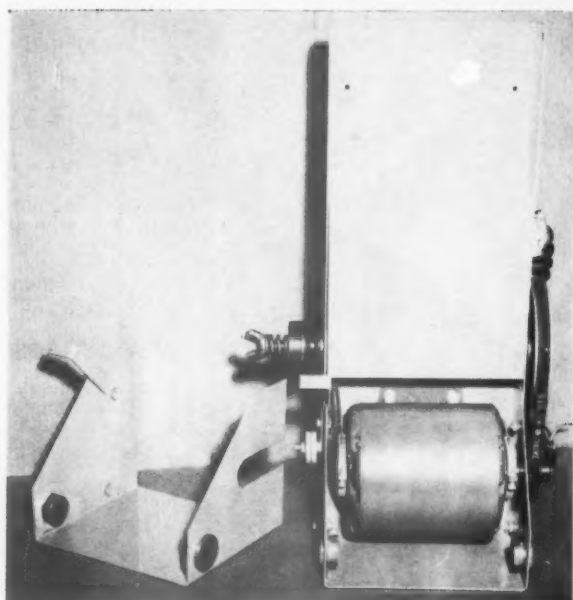
this purpose. Controls are fastened in place by screws applied from the front, yet are easily removed for servicing if required without disturbing the nuts. As these are firmly anchored at insertion, they cannot turn.

Another maker of control instruments, some of which are for aircraft, uses 8-32 x 0.050 in. stainless steel plug nuts in 16 gage aluminum cases so they can be fitted with covers or fastened to dashboard or to other mountings. Such nuts do not rust and are far stronger than any thread tapped in aluminum of the thickness named. Again, these nuts are in blind and inaccessible locations. They stay put in relatively soft aluminum, even if repeated removal of screws is required in service.

TORPEDO BRACKET USES FOUR PLUG NUTS

A rocket-type Mark 43 torpedo, built for the U.S. Navy by a leading Ordnance producer, uses a stamped bracket. Four 6-32 x .050 plug nuts are pressed into four corners of the bracket. These nuts cost less and provide a stronger thread than a thread made in the stamping, even if a collar is extruded at each hole, and the hole is then tapped.

Tapped holes in extruded holes of thin metal sections are expensive and yield somewhat uncertain results, partly because the metal in the extruded hole is thin and may be uneven in thickness. Plug nuts have thicker walls that are case hardened and their head "stiffens" the assembly. All the user need to do is drill or punch the holes and press or drive the nuts into them. Use of these nuts assures top notch fastening for this important component for a submarine torpedo.



Garage door opener and a stamped bracket component having four holes in which nuts are pressed. The nuts will not turn when screws are inserted or removed.

A mold clamp is required for closing graphite molds used in making cable splices for railway signal systems. Each clamp includes two angle brackets of $\frac{1}{4}$ " steel. A thumb screw is used in one hole of each bracket. The maker states that it costs more to drill and tap the hole than to pierce the hole (.374-.379 dia.) and to press in a $\frac{1}{4}$ -20 plug nut. Estimates place the saving realized with these nuts at \$10 to \$15 per thousand clamp units.

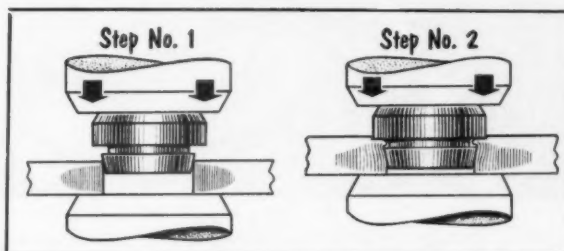
ELECTRONIC GARAGE DOOR OPENERS

A maker of electronic garage door openers mounts control components and motor in a sheet steel case. The case is then fastened to a U-shaped bearing bracket. Four $\frac{1}{4}$ -28 x .050 nuts are pressed into the bracket, which is made of 16-gage steel. Screws that pass through control case enter the nuts to fasten the case to the bracket. All these nuts are in blind locations but screws can be removed easily to permit access for service to parts on the inside of the mounting case; and are easily replaced because the preplaced nuts remain in position. No tool is needed to keep the nuts from turning, as they remain securely anchored. Their hardened threads continue as good as new, even if repeated removal and replacement of screws are required.

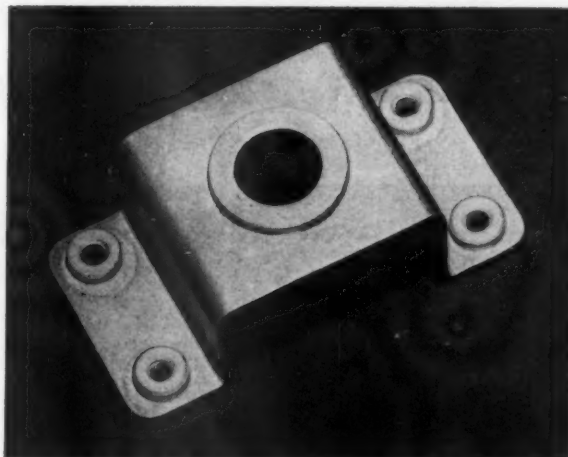
At Lamson & Sessions, plug nuts are commonly made from B-1113 bar steel and hardened. They are also made from 416 stainless steel, heat-treated to C-35 RC hardness, from 2024-T4 aluminum and from brass and other bar materials. Various finishes, including plating, are available. Minimum material product thickness for satisfactory application is .030. Tap sizes range from 4-40 to $\frac{3}{4}$ inch thread. •



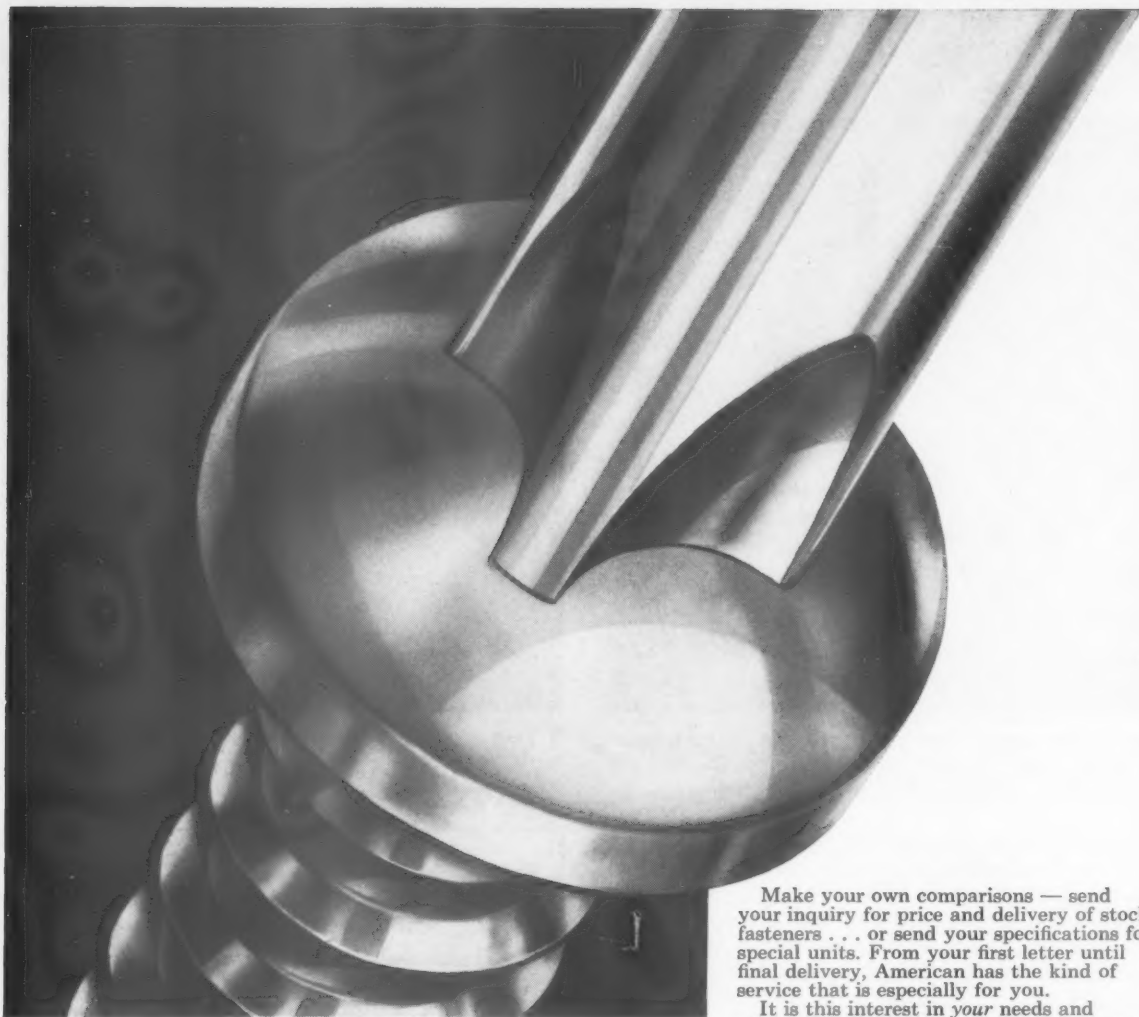
A plug nut that takes a thumb screw provides a wear-resistant thread in cap for holding graphite molds used in cable splicing.



After tapered end of a plug nuts is placed in a mating hole, pressure is applied to force the nut home against an anvil. This causes serrations to bite into hole wall and some of the hole metal to flow into the groove.



Four plug nuts in corners of this stamped bracket hold it securely in place when the bracket is assembled with screws to its mating part in a submarine torpedo.



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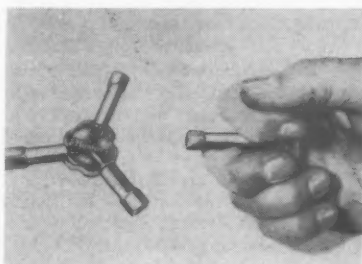
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Assembly and Fastener Engineering

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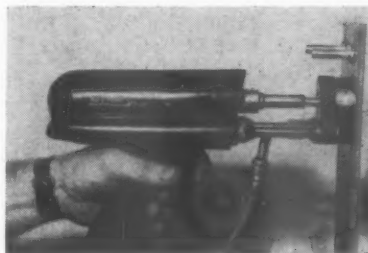
(See No. 101)

MANUAL NUT DRIVER CONTAINS THREE SIZES

Three nut drivers are combined in one manual tool designed to be carried in pocket or tool box. The Atom contains No. 8, 10, 12 nut driver sizes with the three blades welded together at the center hub to allow maximum torque, and covered with a Tenite II button. The size in use projects outward while the sizes not in use are held in the palm of the hand.

Hunter Tool, Box 564, Whittier, Calif.

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(See No. 104)

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An adhesive which sets in seconds and minutes and requires no heat treatment, excessive pressure or catalysts will bond almost all kinds of material.

Eastman 910 is a cyanoacrylate monomer modified with a thickening agent and plasticizer. When the monomer is pressed into a thin film between two surfaces, a polymerization reaction occurs which results in rapid setting.

The adhesive is applied directly from a polyethylene container by spout or dropper on only one mating surface after the bonding surfaces have been cleaned. Manual pressure helps set the bond.

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Use postpaid card. Circle No. 102

ELECTRODE EASES WELDING OF MANGANESE

An electrode, Mangjet, is said to provide easier operation in welding 12-14% manganese steels. The electrode is suitable for building up manganese steel hardsurfacing deposits on either manganese or carbon steels and also for making sound joints between two manganese steel parts or between manganese and carbon steel parts.

Mangjet is a low hydrogen, iron powder electrode that has high deposit rates, smooth beads and a steady arc. It is used with both AC and DC welding machines. Available in 5/32", 3/16", and 1/4" sizes, Mangjet electrodes deposit about twice as much weld metal

per electrode as conventional, non-iron powder electrodes. Each 1/4 inch electrode will cover nine square inches with a deposit 1/8" thick.

Lincoln Electric Co., Cleveland 17, Ohio.

Use postpaid card. Circle No. 103

STUD WELDING GUN FOR ALUMINUM FASTENERS

Aluminum fastener studs up to 1/2" in diameter can now be end welded to aluminum plate, as rapidly and easily as steel stud welding, with the NS-10A stud welding gun.

The portable gun has a special adapter foot which permits inert gas, either argon or helium, to flow through it and surround the weld area. Appropriate equipment meters and controls the gas flow.

Standard studs are made from 4043 aluminum alloy, in lengths up to 3" and several diameters up to 1/2". Tensile strength is 15,000 to 25,000 psi.

Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio.

Use postpaid card. Circle No. 104

TOOL DRIVES FASTENERS INTO CONCRETE, STEEL

A tool which drives fasteners into concrete and steel with no more effort than ordinary nail-into-wood driving is being marketed in a home craftsman kit. The Shure-Set is designed to provide maximum penetration from the energy supplied by a man swinging a hammer.

Jefferson Screw Corp., 11 Great Jcnes St., New York, N.Y.

Use postpaid card. Circle No. 105

ROTARY TRANSFER MACHINE FOR AUTOMATIC ASSEMBLY

A high speed rotary transfer machine is furnished with an integral pressing station to perform crimping, riveting, staking and forming operations in conjunction with automatic assembly or for dial fed secondary press functions in the manufacture of small parts.

Called the Type O Presssembler, the machine incorporates a roller gear drive as the dial indexing mechanism to provide smoothness of transfer without



(See No. 106)

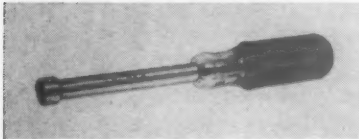
sudden starts and stops. The drive achieves an accuracy of .001" and zero backlash without auxiliary locating or locking methods and is rated for a minimum of 8000 hours operation without maintenance.

Capacity of the press station is 14 tons with a 2" stroke. Two models are available with dial sizes of either 24" or 36" and 6, 8, 12 or 16 stations. The Model E for assembly operations requiring long cycle times and/or variable dwell, has a production rate of 40 pieces per minute. Press station and index table are separately powered and synchronized through electrical interlocks. The Model M Pressembler attains production rates up to 150 assemblies a minute.

Ferguson Machine Corp. Roller Gear Div., 7818 Maplewood Industrial Ct., St. Louis 17, Mo.

Use postpaid card. Circle No. 106

NUT DRIVER FEATURES NON-SLIP, CUSHION GRIP

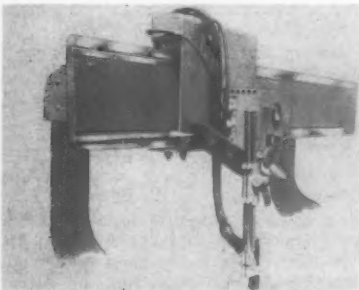


Nut driver No. 49 features a non-slip, cushion grip and unbreakable, blister-proof handle. Blades are nickel plated forged steel. The tool is available in a set of seven sizes: 3/16", 1/4", 5/16", 11/32", 3/8", 7/16" and 1/2", as well as 7/32" and 9/16" from open stock.

Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.

Use postpaid card. Circle No. 107

SIDE BEAM TRACKS FOR PRODUCTION WELDING



Model TP3-1 precision side beam tracks for accurate production welding of foil steels and other metals as thin as .003" are particularly useful in welding honeycomb panel facings, including 17-7-PH, AM-355 and AM-350 steels available only in 24" lengths.

Parallelism of arc travel tolerance on the 12" deep x 3 3/4" thick track is within .005" and, when supported at 6' intervals, the track will withstand a 400 lb. vertical load with less than .005" deflection.

Tracks are available for weld lengths of 6, 8, 10, 12 feet for use on longitudinal weld positioners.

Airline Welding and Engineering Co., 785 N. Prairie Ave., Hawthorne, Calif.

Use postpaid card. Circle No. 108

LIGHTWEIGHT AIR HAMMER FOR "PUSH ON" FASTENERS



A lightweight air hammer attaches "push on" fasteners in one third the time taken by standard hand methods. The Model SP-900B features uniform torque, weighs just 20 oz., and uses only 6.5 c.f.m. at 90 psi. It uses a metering trigger for complete operator control and is available with pistol grip or straight handle.

Superior Pneumatic & Mfg., Inc., 4758 Warner Rd., Cleveland 25, Ohio.

Use postpaid card. Circle No. 109

ALUMINUM WELDING WIRE NOW IN ONE-POUND SPOOLS

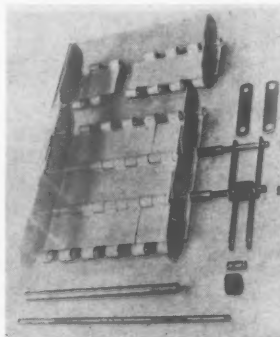
One-pound spools of 3/64" and 1/16" extruded and superclean aluminum are being produced in many types to meet specifications. Previously supplied only on 10-pound spools for inert gas and other welding applications.

Smaller spools accommodate new light equipment in use for welding the assembly of aircraft, ship super-structure, air conditioning and ventilating systems. Emphasis is laid upon cleanliness, surface smoothness and freedom from enfolded drawing lubricants or other impurities.

All-State Welding Alloys Co., Inc., 249-55 Ferris Ave., White Plains, N.Y.

Use postpaid card. Circle No. 110

PAN-JOINT CONVEYOR ELIMINATES CLOGGING



A conveyor eliminates clogging, wedging and spilling of parts through multiple closely-fitted pan joints which leave no opening during movement. Special side flanges prevent parts from spilling over in transit by forming a continuous deep moving pan.

Mechanical wear during Hinged Pan operation is restricted to two easily replaceable parts—a roller and bushing on each hinge pan.

Constructed of No. 12 gauge steel, each conveyor is a self-contained unit, consisting of a head and tail shaft assembly mounted on structural steel framework and usually installed in a trench beneath floor level.

Gifford-Wood Co., Hudson, N.Y.

Use postpaid card. Circle No. 111

PRESET TORQUE WRENCH USES REPLACEABLE KEY



A snap torque wrench, which is preset by the manufacturer to user specifications, then sealed and marked, features a readily replaceable standard socket key.

Wrench operation requires no readings, settings, maintenance or special care. Workers choose the correct wrench for particular applications, then tighten until a snap is heard and felt. This indicates correct torque has been reached. The mechanism is not dependant on friction and accuracy remains within 3% even after 75,000 operations.

Skidmore Engineering Co., 5130 Richmond Rd., Bedford Heights, Ohio.

Use postpaid card. Circle No. 112

PORTABLE SPOT WELDER FOR MEDIUM PRODUCTION



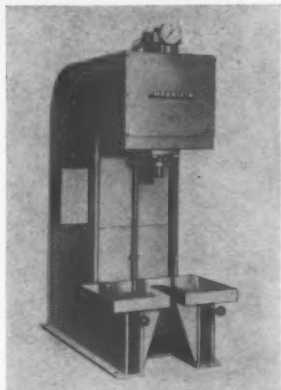
Portable water-cooled gun welders feature built-in electronic timers and magnetic contractors to assure quality spot welds. Models RP-10 and 20 will weld two pieces mild steel up to 1/8" combined thickness and 3/16" combined thickness respectively.

The hand-operated pinch gun is standard, but push guns for welding both sides of the work are available. Welding tips are standard water-cooled type. The entire unit is mounted on a cart with 25' power cord.

Peer, Inc., 1200-1248 Milton St., Benton Harbor, Mich.

Use postpaid card. Circle No. 113

HYDRAULIC BENCH PRESS FOR ASSEMBLY USES



Hydraulic bench presses for assembly operations are being manufactured in the 8 and 10-ton sizes. Dual hand and adjustable down-stroke controls are standard equipment; electric push button control with or without pressure reversal is optional.

Adjustable return stroke permits shortening of the work cycle to where the ram just clears the work piece on repetitive operations. Tonnage is adjustable from 10% to full rated capacity. The presses can be equipped with index tables.

Presses have a 12" stroke: an 8" reach from throat of frame to centerline of ram, and 18" gap. The 8-tonner has the following speeds: Down, advance 525 ipm; Down, feed 200 ipm; Return, 330 ipm. Speeds on the 6-ton model are faster.

Hannifin Co., Dept. 130, Des Plaines, Ill.

Use postpaid card. Circle No. 114

PORTABLE SPOTWELDER FOR LIGHT ASSEMBLIES



Designed for rapid spotwelding of thermocouple junctions and similar light assemblies, a portable gun welder is connected by cable to a transformer and holster suspended from operator's shoulder. A 200 ft. cable connects to a control console which contains the two-channel weld sequence circuit and pneumatic system controlling weld and

forge pressures. Model 4032 uses ignition power controls circuits.

Welder features adjustable tip, detachable mirror, lights for illuminating work. The console is equipped with two complete control channels to avoid the necessity of manipulating the controls between welds on thermocouple wires. A switch on the welding gun switches from one preset channel to the other.

Research, Inc., 115 N. Buchanan, Hopkins, Minn.

Use postpaid card. Circle No. 115

AC-TYPE ARC WELDER HAS 525 AMPERES RANGE



The "Budget 500" AC transformer type arc welder is rated 500 amp. at 40 volts on 60% duty cycle. It has a welding range of 100 to 625 amp. in three overlapping main step settings: 100-300, 195-475 and 375-625. These coarse adjustment steps, with rheostat for fine adjustment, provide dual control to permit choice of open circuit voltage to suit the job.

The 48" high welder is of simple design shell type using the "diverter path" principle. Double primary provides for operation on either 230 or 460 volts.

Hobart Brothers Co., Troy, Ohio.

Use postpaid card. Circle No. 116

HIGH TEMP BRAZING ALLOY RESISTS OXIDATION

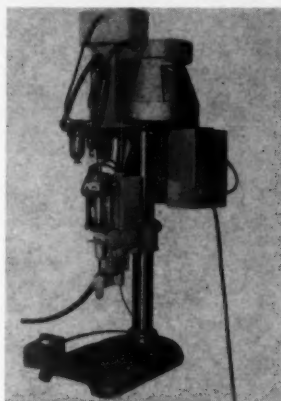
A high temperature service brazing alloy for higher strength and oxidation resistance applications where erosion must be controlled is designated Microbraz. 150. The nickel base materials contains chromium borides and is suited for use in the fabrication of such parts as turbine blades, rotor shafts and highly stressed sheet metal structures. It is available in the form of powder, rod, paste or plastic bonded wire.

The material resists oxidation up to 1800° F plus. Joints are ductile, permitting 720° twist without fracture. Joint strength is 34,000 tensile shear.

Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Use postpaid card. Circle No. 117

ASSEMBLY MACHINE PLACES 72 INSERTS PER MINUTE



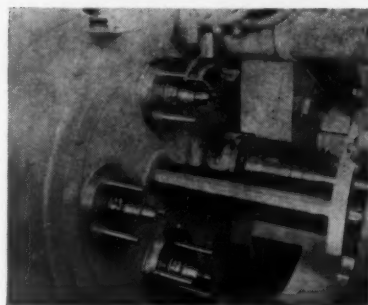
Threaded inserts can be placed and expanded up to 72 per minute on a single punch assembly machine designed to reduce labor and speed production. Inserts are anchored at the time of placing into drilled or molded holes.

The machine consists of vibratory feed hopper, an orientating unit and air cylinder. It can be tooled to place and expand as many as six inserts at a time. Automation combination can be adapted to existing set-ups as arbor and foot presses.

Phelps Mfg. Co., Box 542, Westport, Conn.

Use postpaid card. Circle No. 118

NO TOLERANCE CHANGE WITH NEW ARC WELDER



Automated arc welding of transmission shafts to carrier cases can be done in the complete cycle time of only 12 seconds per piece.

The compact welding machine welds dissimilar alloy pieces, preground and finished, with no measurable change in tolerance. The machine has four rotating fixtures mounted in precision bearings in a vertical rotating head. Head and fixtures are hydraulically driven through a non-locking worm gear drive.

One operator loads the parts into individual fixtures which carry them through the steps of processing—preheating, welding and unloading.

Progressive Welder Sales Co., Pontiac, Mich.

Use postpaid card. Circle No. 119



Our business is making Cold Headed Fasteners.

We have complete facilities for cold heading, slotting, threading, slabbing, turning and many other operations, working with many types of metals.

Our satisfied customers are your best evidence of our ability to solve your fastener problems.

We would welcome the opportunity to work with you.

SCOVILL

Industrial Fasteners Sales
WATERVILLE DIVISION
Waterville 14, Connecticut

Special Cold Headed Parts • Phillips Recessed Head Screws • Clutch Recessed Head Screws • Washer Screw Assemblies (Sems) Tapping Screws • Standard Machine Screws

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WHAT'S NEW IN FASTENERS

For further information on any of the fasteners listed here, use the handy postpaid card opposite this page.

SELF-LOCKING NUT RESISTS VIBRATION



(See 133)

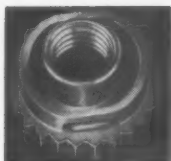
A high carbon steel lock nut eliminates the need for lock washers and speeds up blind fastening applications. The concave undersurface of a P-M locknut guides the screw to hole threads. It features cut threads which make for greater strength and a claim of high vibration resistance.

The nut is adaptable for both permanent and demountable assemblies. When tightened flat, threads are deformed against the screw for permanent fastening. When tightened to recommended torque, locking pressure is applied to threads but nut may be disassembled and re-used.

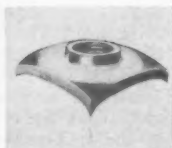
Waterbury Pressed Metal Co., 300 Chase Ave., Waterbury, Conn.

Use postpaid card. Circle No. 130

PRESS NUT "FLOAT" TOTALS .030 WITHIN RETAINER



(See 131)



(See 130)

A floating press nut incorporates all of the advantages of the fixed press nut plus the added feature of float of the nut within its retainer (.030 total).

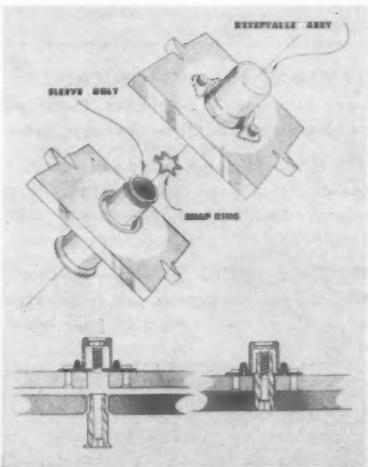
Installation involves drilling or punching one hole and pressing the nut in. Push-out, torque-out, tensile strength and locking features exceed the requirements of MIL-N-25027.

The nut is available in carbon steel in sizes No. 4 through 1/4".

Rosan Inc., 2901 West Coast Hwy., Newport Beach, Calif.

Use postpaid card. Circle No. 131

FAIL SAFE PANEL FASTENER IS FLOATING, SELF-LOCKING



(See 132)

A structural panel fastener, in standard and self-sealing types, is available in two lug and corner mounting styles. The self-jacking action of the sleeve bolt eliminates binding problems when removing panel. Even semi-circularly curved panels are easily removed, since the loosened sleeve bolt can be retained flush with panel inner surface.

This fastener permits panel misalignment of as much as .040" per hole and closes gaps up to 1/8". Sleeve bolt is quickly removable and even the recep-

tacle is replaceable without drilling out attaching rivets. Receptacle is self-draining to prevent moisture accumulation. Fail safe construction prevents over torquing, and the oversized deep hex recess permits power driving and high installation torque.

Materials used are alloy steel for 550°F and corrosion resistant steel for 800°F applications.

Nutt-Shel Co., 2701 S. Harbor Blvd., Santa Ana, Calif.

Use postpaid card. Circle No. 132

TERMINAL CLAMPS FOR WIRE FASTENING

Terminal clamps offer a positive locking device for wire fastening in the electric, electronic and communications industries.

The serrated multitooth lock washer is permanently fastened to the bolt, yet rotates freely for tighter locking torque. The base of the clamp fits standard board openings and being made in one piece will not come apart during assembly. It is available in sizes from 5/16" to 1" in all types of slotted or Phillips heads.

Reliance Div., Eaton Mfg. Co. Massillon, Ohio.

Use postpaid card. Circle No. 133

LIGHTWEIGHT LOCKNUT FOR TEMP USE UP TO 1200°F

A high-strength locknut for temperature applications up to 1200°F is reported to be the first lightweight nut for its rated temperature and stress levels to be fully documented in an extensive series of service—stimulating tests.

The FN 1216 has a minimum tensile strength of 200,000 psi at room temperature and over 150,000 psi at 1200°F.

Available in four diameter sizes, including No. 10-32 through 3/4"-24, they are intended for structural applications on jet engines, missiles, aircraft and related equipment.

As much as 57% lighter than conventional 1200°F standard, they can be mounted close to corner and perpendicular bulkheads and permit small bolt circles in flange applications.



WHO PUT THE WATER ON MRS. MURPHY'S CEILING?..

NOT US!... "P-K STAPS in air conditioner assemblies prevents moisture seepage," says GENERAL ELECTRIC.



"In attic-mounted central air conditioner units, leakage from base pans could not only cause corrosion of sheet metal exterior panels, but worse yet—might wet a customer's ceiling!

"Using Parker-Kalon Staps which have a flexible nylon washer extending .118 under the head of the fastener, provides a positive seal—effectively prevents leakage and corrosion," says Mr. M. W. Hays, General Electric Air Conditioning Department, Tyler, Texas.

P-K Staps consists of a unique self-conforming translucent nylon washer, preassembled to standard P-K Self-tapping Screws. When tightened, pressure causes the nylon to fill any irregularities of the engagement hole—actually flow into the thread interstices—forming a watertight, hermetic seal.

Furnished in a wide variety of styles and sizes. Also available in Neoprene washer styles. Write for samples and complete information.

Sold Everywhere Through Leading Industrial Distributors.

PARKER-KALON[®] STAPS[®] fasteners

PARKER-KALON DIVISION, General American Transportation Corporation. Originators of the Self-tapping Screws; Manufacturers of Socket Screws, Screwnails, Masonry Nails, Wing Nuts, Thumb Screws and the new Ringuard Weld Screw.

Use postpaid card. Circle No. 230

USEFUL LITERATURE

To receive your copy of any literature reviewed here, use the postpaid card opposite page 48.

ADHESIVES

Facilities for producing over 650 different adhesive formulations for industrial application pictured in two-color circular. Eighteen typical uses for adhesives illustrated in easy-reading manner. Rubber and Asbestos Corp., 225 Belleville Ave., Bloomfield, N.J.

Use postpaid card. Circle No. 1

SELF-PIERCING NUTS

Nuts which pierce their own assembly holes, insert and secure firmly in the hole are described in 8-page brochure. Seven-nut line chart compares features in easy-to-follow fashion with various application requirements. Photos, diagrams illustrate how tooling can be integrated with present equipment. Specifications given. Fabristeel Products, Inc., 21500 West Eight Mile Rd., Detroit 19, Mich.

Use postpaid card. Circle No. 2

ALLOY FABRICATION

Information on how to fabricate "Hastelloy" alloys is presented in a 36-page booklet covering step-by-step procedures for welding, forging, forming, brazing, grinding, machining, heat-treating and descaling and pickling. It also includes data on lining of vessels and corrosion surfacing along with necessary boiler code material. Haynes Stellite Co., Kokomo, Ind.

Use postpaid card. Circle No. 3

COPPER WELDING

A 12-page pocket folder of "how-to-do-it-on-copper information" for welding and maintenance department personnel answers users' questions with regard to the increasing number of problem-solving alloys and fluxes offered for work on copper and copper-bearing alloys in maintenance, production and installation. The 19 of these alloys now include two special silver alloys designed for use in joining copper, brass, bronze, aluminum, stainless steel, steel, monel and combinations of

these other metals. All-State Welding Alloys Co., Inc., White Plains, N.Y.

Use postpaid card. Circle No. 4

SELF-LOCKING NUTS

Self-locking nuts employ nylon collars to grip threads with sealing, vibration resistant action. Types of nuts are illustrated in 4-page circular: clutch, instrument mounting, spline, thin and standard models. Description of facilities and ordering program. Greer Stop Nut Co., 2618 W. Flournoy St., Chicago 12, Ill.

Use postpaid card. Circle No. 5

ELECTRIC POWER TOOLS

Multi-colored 35-page data book presents complete treatment of portable power assembly tools. Each model of the line is photographed in typical application, followed by large illustration of clature and special features. Screw drivers, impact wrenches, tap guns, of each model with numbered nomenclature and facts to help select proper tools and fasteners to use. Specification tables, charts. Black & Decker Mfg. Co., Towson, Md.

Use postpaid card. Circle No. 6

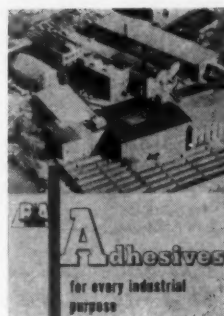
RETAINING RINGS

Retaining rings, available in automatic, semi-automatic and manual dispensers, are described in 6-page bulletin. Three series—external, shaft, housing—are specified by shaft diameter, groove and ring sizes, weight, thrust load in lbs. Materials, finishes, features outlined. Rotor Clip Co., 114 Allen Blvd., Farmingdale, L.I., N.Y.

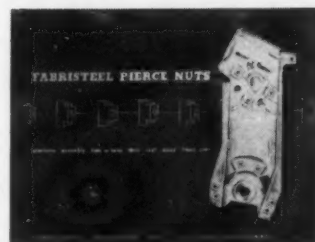
Use postpaid card. Circle No. 7

SEALING FASTENERS

Fasteners and washers featuring absolute weather-tightness are described in a handy 28-page technical report. The one-piece metal and neoprene composition sealing washer is distributed separately or as part of end and side lap screws for metal, plastic



(See 1)



(See 2)



(See 6)

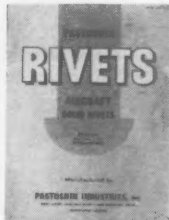
and wood. Two water leakage reports are reproduced, blue-print type drawings illustrate typical applications with comparative costs. Fabricated Products Co., Inc., West Newton, Pa.

Use postpaid card, Circle No. 8

ASSEMBLY PRESS

Automatic hydraulic C-Press, adaptable to 32 applications including assembling and riveting, is presented in attractive 11-page bulletin. New model features, performance, accessories, index table and dimensions are outlined. Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

Use postpaid card, Circle No. 9



AIRCRAFT SOLID RIVETS

Aircraft solid rivets price list and specifications printed in easy-to-read 18-page catalog. Purchasing information accompanied by photographs of manufacturing process of aluminum alloy rivets of many types and several finishes. Chart shows popular head styles and standard head markings. Pastushin Industries, Inc., 5651 West Century Blvd., Los Angeles, Calif.

Use postpaid card, Circle No. 10

SET SCREW CALCULATOR

Pocket-sized "slide rule" calculator gives technical data for set screw sizes No. 0 through 1" and cap screws No. 0 through 1½". Threads per inch, Rockwell hardness and other specifications for set screws; tap drill size, maximums for both button and flat head socket cap screws. Handy charts on torsional and shear yields. Cased in sturdy, two-color plastic covering. Allen Mfg. Co., Bloomfield, Conn.

Use postpaid card, Circle No. 11

ALLOY ROD

Alloy No. 1032 is composed of 99.75% copper and .25% sulphur, typically used for welding tips, soldering iron tips, contact pins or inserts in multiple contact assemblies. Available in rod form only, the advantages, fabricating processes and properties are listed on data sheet. Scovill Mfg. Co., Waterbury 20, Conn.

Use postpaid card, Circle No. 12

PNEUMATIC RIVETERS

Pneumatic riveting hammers for both light and heavy duty operation are described in 9-page brochure. Ranging from 1050 to 3200 blows per minute and ⅛" to ¾" rivet capacity, the tool specifications are listed. Cross-sectional illustration points out nomenclature. Hammer kit accessories available. Skil Corp., 5033 Elston Ave., Chicago 30, Ill.

Use postpaid card, Circle No. 13

SPIRAL PINS

A commercial pin used in mechanical, electrical and electronic assembly is described in 12-page catalog. The carbon steel pin assumes the shape of the hole, locks in place and can be fed automatically. Available from 1/16" to ½" diameter. Price list and specification data given. Conn. Engineering & Mfg. Co., 24 School St., Danielson, Conn.

Use postpaid card, Circle No. 14

SOLDER TERMINALS

The introduction of three new solder terminals specifically designed for molding into plastic headers for use with printed circuits or with miniature tube sockets is told in 14-page hard-cover catalog. The standard line of terminals is also specified by drawings. Alpine Electronic Components, Inc., Waterbury, Conn.

Use postpaid card, Circle No. 15

MINIATURE THREADS, TOOLS

Designers and manufacturers of instruments and parts requiring fasteners with miniature threads between 56 and 160 per inch will find Catalog 98 a concise source of information on stock taps dies, screws and tools. Dimensions, tables and other data, including an outline of special order facilities, contained. J. I. Morris Co., Southbridge, Mass.

Use postpaid card, Circle No. 16

RETAINING RING TOOLS

Dimensions and specifications for retaining ring pliers, applicators, dispensers and grooving tools are published in 16-page Catalog AT-10-58. The assembly tool booklet also includes a selector guide to the 20 standard ring series available, illustrations of assembly fixtures for internal and external rings and range and advantages of the grooving tool. Waldes Kohinoor, Inc., 47-16 Austel Pl., Long Island City 1, N.Y.

Use postpaid card, Circle No. 17



SEALING WASHER

Measured amount of sealing compound adhered to underside of metal washer seals three protective ways. Complete description in 4-page brochure, plus large illustrations showing action before and after torque is applied. L. J. Barwood Mfg. Co., Inc., Everett 49, Mass.

Use postpaid card, Circle No. 18

SQUARE NUTS

A precision square nut catalog insert presents the advantages of cold formed square nuts that are double chamfered, double countersunk with the hole accurately centered and the face smooth. Recommended for insertion after the

Standard section in products catalog. National Machine Products Co., Utica, Mich.

Use postpaid card, Circle No. 19

SOLDERLESS CONNECTIONS

How air tools make solderless wrapped electrical connections is fully treated in 16-page brochure. Large type, profuse illustrations explain the history of solderless terminal connecting, the requirements and advantages, the installation. Terminal spacing and dimensions and tool specifications. Keller Tool Co., Gardner-Denver Corp., Grand Haven, Mich.

Use postpaid card, Circle No. 20



SELF-LOCKING CLINCH NUTS

How self-locking, self-clinching nuts function in use in thin, sheet-metal products is outlined in engineering Bulletin SL-858. Data is given on thread sizes, shank lengths for various sheet thicknesses, mounting hole dimensions and suggested installation forces. Torque and push-out resistance, metals of construction and finish, temperature ranges also provided. Penn Engineering & Mfg. Corp., Doylestown, Pa.

Use postpaid card, Circle No. 21

SCREW THREAD INSERTS

Military equipment designers and contractors whose work does not permit use of general commercial tolerances will find Bulletin 689A useful in identifying and accepting screw thread inserts in National Coarse and National Fine sizes through 1" diameter. The 16-page manual has five sections: military standards vs. insert number and reverse, assembly dimensions, typical process sheet for installation and tables of specifications and charts. Heli-Coil Corp., Danbury, Conn.

Use postpaid card, Circle No. 22

ELECTRIC DRILLS

Map-folded data sheet illustrates and describes 12 electric drill models designed for heavy-duty work. Features pointed out by cut-away diagram. Specifications charted. Drill stands and accessories shown. Milwaukee Electric Tool Corp., Milwaukee 8, Wis.

Use postpaid card, Circle No. 23

STEEL FASTENERS

Prices covering standard ferrous bolts and other fasteners are listed in easy-to-interpret 42-page catalog. Identified by length and diameter, the bolts are catalogued by price per 100, container quantities and weight per 100. Screws, studs, nuts, washers included in line. Standard Nut & Bolt Co., Valley Falls, R.I.

Use postpaid card, Circle No. 24

STAINLESS STEEL FASTENERS

Matching stock and price list catalogs for third quarter give complete specifications on 10,000 items in standard inventory of stainless steel nuts, bolts, pins, studs, washers, as well as line of nylon fasteners. Photos of the plant facilities to produce fasteners, hot forged, cold headed and screw machine items. Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N.Y.

Use postpaid card. Circle No. 25

ANTI-VIBRATION FASTENER

Applications of a blind, watertight fastener with anti-vibration properties are presented in 4-page brochure. Used in appliance, electronic, aircraft, auto industries, the fastener is made of neoprene bushing with a bonded threaded brass nut in one end and a flange on the other end. The action of turning a screw in the nut causes the neoprene to be drawn tight against the back of the material in the form of a strong "rivet" head. Dimensions given. Rockwell Products Corp., 146 Central Ave., Newark 3, N.J.

Use postpaid card. Circle No. 26

THREAD ROLLERS

Three planetary thread rolling machine models with speeds ranging from 250 to 800 pieces per minute are described in 4-page data sheet, containing specifications and illustrations of typical work. Model 125A handles 5/16" diameter up to 3" lengths; Model 300, hollow work, class three fit; Model 200, 1/4" to 3/8" rolling diameters. Prutton Corp., 5295 W. 130th St., Cleveland 30, Ohio.

Use postpaid card. Circle No. 27



BLIND RIVETING

A hammer driven rivet for blind or limited access application is described and cataloged in six-page brochure. The aluminum alloy Pin-Grip is assembled with knurled drive pin which, when driven flush with the head, expands the slotted shank and grips firmly. Six type heads available. Specifications, typical applications, ordering information. Star Expansion Co., Mountainville, N.Y.

Use postpaid card. Circle No. 28

BLIND EXPANSION RIVETS

Blind expansion rivets—whose chemical-containing shanks expand when heat is applied to the rivet head—are described in a 14-page bulletin. The one-step operation is illustrated with diagrams showing proper installation procedure for brazier head, 100° countersunk head, 140° countersunk head rivets. Tooling and dimensional data

included. Explosives Dept., E. I. Du Pont De Nemours & Co., Wilmington 98, Del.

Use postpaid card. Circle No. 29

HYDRAULIC PULL TOOL

Hydraulic pull tools for installing fasteners and blind rivets specified in eight-page booklet with in-use photos, nomenclature of three models and sizing of fasteners designed to drive. Tools developed for driving in confined areas. Power cells available for either two or four tool units. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Use postpaid card. Circle No. 30



BRAZING PREFORMS

Handy two-color double-spread chart presents material and preform selections and design considerations for brazing preform users. The characteristics of gold, silver, aluminum brazing and soldering alloys—their composition, melt and flow points—are given. Twelve types of preforms and their applications are illustrated. Lucas Milhaupt Engineering Co., 5051 S. Lake Dr., Cudahy, Wis.

Use postpaid card. Circle No. 31

SMALL BRAZED ASSEMBLIES

Facilities for the manufacturing of small brazed assemblies are presented in stylish 4-page brochure. Photographs and captions show typical tubing, stamping and machining operations. Copper brazing is done in controlled atmosphere. Various types of components manufactured are also displayed. Walco Mfg. Div., Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Use postpaid card. Circle No. 32

CORE HOLE PLUGS

Core hole plugs for use in engines are attractively presented in 6-page brochure. Standard specifications for the cold-headed parts range in diameter from 1/8" to 2", available in steel, brass and aluminum. Tips for designers included. Pittsburgh Plug and Products Co., Box 304, Evans City, Pa.

Use postpaid card. Circle No. 33

REVERSIBLE SCREWDRIVER

A 9 1/2 oz. pneumatic reversible screwdriver designed to drive number eight machine screws is introduced in Bulletin S-558-1. The balanced impact mechanism absorbs the driving torque, permitting finger-tip operation and control. Specifications and standard and optional equipment included in description. Cleco Air Tools, Box 2119, Houston 1, Texas.

Use postpaid card. Circle No. 34

SCREW THREAD METROLOGY

Ways to help industry solve fastener fit problems are outlined in a 16-page handbook reviewing both function and facilities of each of three new Screw Thread Metrology Laboratories. The heavily illustrated booklet gives a well-guided tour of the various precision equipment need for checking unified screw threads (classes 3A, 2A, 3B, 2B), tapered plugs (ANPT, NPTF) as well as special precision thread forms. A seven-page appendix of reference material extracts pertinent data on screw thread dimensions and tolerances from the recently revised H-28 Handbook. The labs are located in Jenkintown, Pa., Cleveland and Santa Ana, Calif. Standard Press Steel Co., Jenkintown, Pa.

Use postpaid card. Circle No. 35

RESISTANCE WELDING

A standard specifications chart on a resistance welder line is designed for the wire fabricating, sheet metal wrought iron and tubing industries. Complete data is listed for projection and spot welders made for all voltages and frequencies. Alphil Spot Welder Mfg. Corp., 1058 Pacific St., Brooklyn 38, N. Y.

Use postpaid card. Circle No. 36

TENSILE TESTING TOOL

A machine which tests the tensile strength of fasteners and also used to calibrate impact wrenches is described in four-page folder. The need for the machine is presented and use illustrated. Handy chart shows required load for standard screws: ultimate strength in lbs. of various sizes and grades of bolts. Skidmore-Wilhelm Mfg. Co., 442 Green Rd., Cleveland 21, Ohio.

Use postpaid card. Circle No. 37



LOCK NUTS

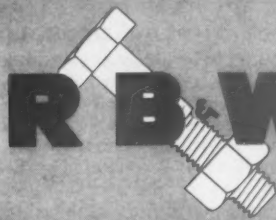
Engineering data and features of nine locknuts are presented in 14-page two-color bulletin, which includes complete price list. Cross-sectional drawings, illustrations of typical applications included for hex, countersunk, center-lock, weld and lock nuts. Grip Nut Co., South Whitley, Ind.

Use postpaid card. Circle No. 38

STAINLESS "AN" FASTENERS

"AN" stainless steel fastener line is catalogued in 8-page technical folder, complete with dimensions, specifications, illustrations of aircraft bolts, machine screws, nuts, rivets, washers. All-metal Screw Products Co., Inc., 821 Stewart Ave., Garden City, L.I., N.Y.

Use postpaid card. Circle No. 39



FASTENER BRIEFS

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY



Technical-ities

By John S. Davey

How to select tapping screws

1. Use *thread forming* screw Type A, B or C when material is ductile enough to stand de-forming action of screw. If not, use *thread cutting* type.
2. Type A is used with pierced hole for starting; and where an exposed point doesn't matter. All other cases use B, C, or other blunt screws in drilled holes.



3. When load is no factor, metal gauge determines diameter of screw. Pick a thread pitch which gives at least a full thread engagement.

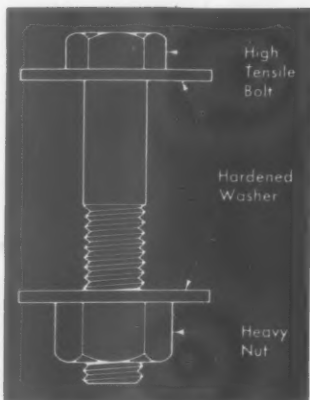
FOR EXAMPLE: Metal .062" thick suggests use of #7 Type A or #10 Type B (both have 16 threads/inch).

$$\text{PITCH} = \frac{1.00}{16} = .0625"$$

4. When you do have loads to sustain, you must consider required holding power. If metal thickness doesn't allow ample thread engagement (so that threads strip), use more smaller diameter screws. They engage more threads. Limiting factors: the screw's torsional strength, and the effort to drive it.

5. If, due to material thickness, screws fail by torsion or drive too hard, select cutting screws (1, F, or 23). For hard ductile materials, the Type 1 is best; for soft, friable materials, the Type 23.

Two basic ways to keep fasteners tight



RB&W high strength bolts permit optimum tightening without crushing surface when used with hardened washer.



Section of Spin-Lock screw. Teeth embed only with proper tightening. Same feature available in nuts.

Fasteners that stay tight keep joints strong. Resistance to loosening depends largely upon: (1) The inherent "locking" ability, (2) The man with the wrench.

HIGH PRELOADING

With rigid type joints, one of the best "locking" fasteners is a standard RB&W high strength bolt or cap screw . . . *torqued up close to its yield strength*. It locks by its own internal residual tension.

High tension not only keeps it permanently tight, but also prevents fatigue, assures optimum load capacity and safety.

INTEGRAL LOCKING DEVICE

Suppose the design of fastened members can't take full advantage of such preloading? Then a lock is needed, such as that furnished by RB&W Spin-Lock® screws and nuts. Ratchet-action teeth bite into seat; require 20% extra torque to loosen.

Note that Spin-Lock fasteners seat solidly before locking. The installer can't be deceived. He *has* to tighten properly before feeling resistance.

In both cases above, *positive* tightening assures positive fastening.

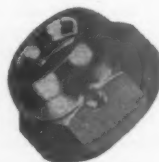
Send for Bulletin on Spin-Lock fasteners, or call your local RB&W Fastener Man. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

Plants at: Port Chester, N.Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco.

Staked acorn nuts lock securely

Staking opposite sides of these RB&W acorn nuts deforms threads for a positive grip. It also puts middle of nut slightly out-of-round, for a spring tension locking effect. They're designed for applications such as outdoor furniture, where anchoring fasteners is more important than solid seating. Available in aluminum, steel, silicon bronze.

These all-metal nuts can also be furnished in regular double chamfered style. Since they lock with their middle threads, they can be turned onto screw from *either* side.



Use postpaid card. Circle No. 231

INDUSTRY MAKES NEWS



George Gregory presents 1958 stud welding award to Dr. J. C. Chapman while R. C. Singleton of Gregory Industries looks on.



Part of Meridian Metalcraft's largest aluminum dip brazing facility in the West includes a pre-heat oven and 45 cubic foot salt and flux tank.

BRITISHER WINS STUD WELDING AWARD

Winner of the 1958 Gregory Award for "the year's most outstanding contribution in the field of semi-automatic electric arc stud welding" is Dr. J. C. Chapman, Imperial College of Science and Technology, London, England.

The \$1500 prize was presented by George E. Gregory, president of Gregory Industries, Inc., Lorain, Ohio, at the annual Awards Luncheon of the American Society for Metals.

Dr. Chapman's paper described the use of end-welded studs in connection with vibrating wire strain gauges, as used to measure stresses in steel building members. The studs served two purposes in the strain gauge assembly: to transmit strain information to the gauges and to secure the gauges to the steel assembly structure.

OLIN MATHIESON BUILDS RESEARCH CENTER

Research in fusion welding, bonding, metallography, among other fields, will be carried on in a metallurgical research center for Olin Mathieson Chemical Corporation to be completed in New Haven, Conn., by mid-1959.

The \$4 million installation will combine laboratories and a pilot production plant. Activities will be coordinated by Gilbert R. Schockley, Metals division vice-president for research and development, announces president Stanley de J. Osborne.

Manager of the Metals Research laboratory is Warren S. Peterson and manager of the Nuclear Fuel Research laboratory is Emanuel Gordon.

MERIDIAN OPENS DIP BRAZING PLANT

Meridian Metalcraft, Inc., has opened the largest aluminum dip brazing facility in the West at its Whittier, Calif., site. President C. M. Peterson announces that the installation will handle quantity production of aluminum assemblies in the electronics, aircraft and missile fields.

A 2400 sq. ft. building houses the 45 cubic foot brazing tank (36" x 36" x 60" deep) and allied equipment.

In dip brazing, chemically cleaned parts are fastened together on a jig, or by pins and clips, and a

continued

brazing alloy is placed at the face of each joint to be welded. The entire unit is preheated to 1000°F in an oven, then dipped into a bath of molten salt and flux. This prepares the surface of the metal and forces the brazing alloy to flow into the joints, making a weld of high strength.

INVENTOR POUPITCH HONORED AT FASTEX

O. Jules Poupitch, inventor with some 150 patents, was honored with a commemorative watch upon celebrating his 25th anniversary with Illinois Tool Works, Chicago. President H. B. Smith made the presentation at the Fastex Div. plant in Des Plaines where Poupitch is product development consultant.

RESEARCH, WORKS DIRECTORS AT ALLEN



CHANTLER



FAUST

The Allen Mfg. Co. of Bloomfield, Conn. announced the appointment of Samuel W. Chantler as director of research and development and Elbert R. Faust as works manager. Chantler joins the firm after 14 years as chief production engineer for the Elastic Stop Nut Corp. where he was issued patents on the "Rollpin" and self-locking screw. Faust comes to the socket screw manufacturer from Waterman Pen Co. where he was vice president in charge of manufacturing.

PARKER SEAL NAMES NEW OUTLETS

Franchised distributorships on industrial Stat-O-Seals for bolts and fasteners have been granted to Dixie Bearings, Inc., Atlanta, Ga., Avel Sales & Engineering Co., Indianapolis, Ind., and the Irving B. Moore Corp., Boston, Mass., by the Parker Seal Co., division of Parker-Hannifin Corp., Cleveland, Ohio, and Culver City, Calif.

WELDING GROUP ELEVATES WILCOXSON

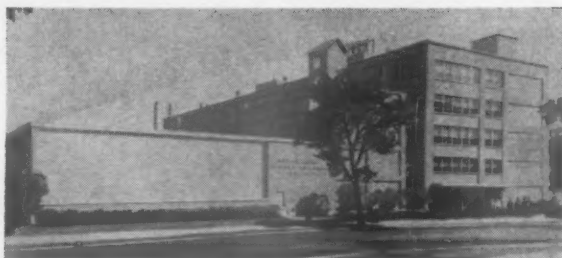
Leslie S. Wilcoxson, vice president in charge of The Babcock & Wilcox Company's Boiler division, has been elected to a three-year term as executive committee vice-chairman of the Engineering Foundation-Welding Research Council. He had been a member of the committee for several years. Investing \$600,000 annually on welding research, the council serves both government and industry. Wilcoxson has been with B&W since 1926 and holds many U.S. patents.



NYLOK APPOINTS MICHIGAN DISTRIBUTOR

The Nylok Corporation, Paramus, N.J., manufacturer of self-locking fasteners, has named Gehringer & Forsyth, 16151 James Couzens Highway, Detroit, sales and service representatives for the Michigan area.

One of the principals of Gehringer and Forsyth, largest sales and service organization in Michigan, is "Charlie" Gehringer, former Detroit Tiger baseball star and a member of Baseball's Hall of Fame.



Artist's conception of \$4 million Olin Mathieson research center to be finished in mid-1959 in New Haven, Conn.

RELIABILITY FILM OFFERED BY SPS

"The Search for Reliability," a 28-minute color, 16 mm industrial film is offered for group showings by the Standard Pressed Steel Co., Jenkintown, Pa.

The narrated documentary dramatizes the need for reliability in all fields in today's "automated, electronically regulated wonderland of technical wizardry" for both laymen, designers, product engineers and top management.

ANCHOR ANNOUNCES SALES APPOINTMENTS

The appointment of three new sales representatives was announced by Roland Largay, vice president—sales, of Anchor Fasteners, Inc., Waterbury, Conn. Alfred P. Kachergis will cover northern New York; Dwight E. Ransdell, northern Ohio and A. C. Wahl Co., southern Ohio.

COX NEW THOMSON CO. AD MANAGER

G. Robert Cox of Brighton, Mass. has been named advertising manager for Judson L. Thomson Mfg. Co., Waltham, Mass., announced Kenneth E. Joy, general sales manager of the firm.

Cox came from J. M. Lord Inc., where he was account executive and a member of the firm's new business team. He previously held a senior copy-writer's position at BBD&O in New York. Cox has been with Proctor & Gamble and the Boston Gear Works in advertising.



WEDGELOCK AIRCRAFT SALES UP

Executives of Wedglock Corp., North Hollywood, and Pioneer Aluminum, Inc., Los Angeles, manufacturer and distributor respectively for a line of sheet metal fasteners and clamps, report that sales to the aircraft industry for the 3d and 4th quarters of 1958 were considerably ahead of the first six months. New product development is the key to '59, according to Lewis C. Finkle, vice president of Wedglock.

CARROLL JOINS AMERICAN SEALANTS STAFF

Robert E. Carroll, Jr., has been named manager of market development for the American Sealants Co. of Hartford, Conn. He comes to the firm from the Ingraham Co. where he was director of advertising and public relations. Previously, Carroll served as a market analyst at the Stanley Works. He was graduated from the Yale University school of engineering.

VAN LEUVEN TO MANAGE BRISTOL SALES

H. E. Beane, vice president—sales of The Bristol Co., has announced the appointment of W. C. VanLeuven to the position of sales manager, Socket Screw Products Div.

VanLeuven has been the company's midwest regional sales manager, Socket Screw Div. since 1956, with his headquarters in Detroit. A graduate of Lawrence Institute, he has been with the company since 1948. VanLeuven is making his headquarters at the company's home offices in Waterbury, Conn.

BALDWIN CO. PURCHASED BY GULLO

The Baldwin Manufacturing Co., Waterbury, Conn., has been purchased from the estate of the late Clarence Bouchard, its founder, by Francis V. Gullo and his associates. The new owners have retained the entire organization and announce that the business will be continued from the same location.

Gullo, president and general manager, was formerly vice president of manufacturing and a director of Casco Products Corp., with whom he was associated 20 years. Prior thereto he was with the General Electric Co.

VEEDER-ROOT ELECTS TOP EXECUTIVES



STAUBLE



SPAUNBURG

Harvey L. Spaunburg was elected chairman of the board of directors and Wilbur C. Stauble president of Veeder-Root Inc., Hartford, Conn. Andrew J. Rebmann, vice president and secretary, was also elected to the board.

Spaunburg, who has been president of Veeder-Root since March 1954, succeeds John H. Chaplin, deceased. Stauble has been president of the Holo-Krome Screw Corp., a subsidiary, and will also continue in this position. Stauble was one of the founders of Holo-Krome, which started in 1929, and has been president since 1952. Arthur E. Kallinich, vice-president of Veeder-Root, was appointed to the board of Holo-Krome to fill Chaplin's unexpired term.

HUNTOON IS STANDARDS DEPUTY DIRECTOR

Dr. Robert D. Huntoon has been appointed to the newly created position of deputy director of the National Bureau of Standards, U. S. Department of Commerce. He will direct and review programs, working through five associate directors. Dr. Huntoon joined the staff in 1941 and will continue to serve as associate director for physics. He is a former physicist with the vacuum tube division of Sylvania Electric.

NEW ASSEMBLY SUPERINTENDENTS AT DODGE

Two new general superintendents at the main Dodge assembly plant in Hamtramck Mich., are R. C. Vollmer, trim, engine dress-up, chassis & final assembly, and F. M. O'Connor, body construction and paint. Vollmer joined Dodge in 1954 after 10 years in Chrysler's experimental engineering department and O'Connor has been with the firm for 25 years. Both were formerly assistant superintendents-manufacturing.

KAYLOCK NAMES WESTERN MANAGER



Appointment of Harold K. Hatfield as western regional sales manager of the Kaylock Mfg. Co., Inc. has been announced by Kenneth Davis, director of sales and advertising. Hatfield will cover all states west of the Rockies and will operate from the Kaynar office at 7875 Telegraph Rd., Rivera, Calif. He has been a sales engineer with the firm for five years.

Victor Hassel, eastern sales manager, has taken over his new duties in Wichita, Kan.

SPECIAL RIVETS
like some of the samples shown here . . . or the more commonly used tubular and split rivets . . . they're all alike to the American Rivet Co. And always—our own special brand of quality and service that gets you what you want when you want it.

THE AMERICAN RIVET CO., Inc.
849 N. Kedzie Ave., Chicago 51, Ill.

Write for price list. For specials, send specifications for prices.

BUY AMERICAN *Tubular and Split* **RIVETS**

Use postpaid card. Circle No. 232

**THE MOST COMPLETE SOURCE
ON THE EAST COAST
For Every IMPORTANT FASTENING**

KEYSTONE BOLT & NUT CORP.
125 CHURCH ST. NEW YORK 7, N.Y.

COLD HEADED PRODUCTS
Immediate Delivery

IN ALL METALS
Catalog on Request

When the chips are down "KEYSTONE" is your best bet to solve all your fastener problems. We Maintain the Largest Stock of BOLTS, NUTS, SCREWS, RIVETS & WASHERS in different metals, sizes and types, on the east coast. You're sure to find them here! And we will get them to you fast.

SPECIALS TO BLUEPRINT SPECIFICATIONS

KEYSTONE BOLT & NUT CORP.

125-A CHURCH STREET WO 4-4600 NEW YORK 7, N.Y.
NASHVILLE, TENN. SALES & WAREHOUSE 919 5th AVE. SOUTH
MANUFACTURING BRANCH BRISTOL, CONN.

Use postpaid card. Circle No. 233

New . . . Revolutionary
BLIND FASTENER with THREADS

MOLLY
JACK
NUT



The **ONLY** Blind Fastener
Which Grips **ANY** Material
From 0" to 3/16" Thick

Ask Your Industrial Distributor or
Write for FREE Brochure



MOLLY CORP.

230F N. 5th St., Reading, Pa.

MOLLY JACK NUT
IS EASY TO INSTALL



1 Insert Jack Nut into hole. Needs only 1/8" expansion space.

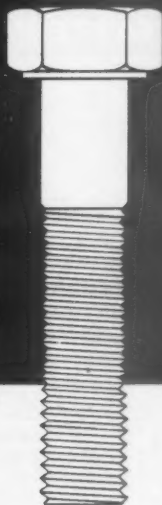


2 Run in screw to collapse spider anchor backing by exerting pull on threads.



3 Jack Nut now is installed and ready to receive attachment screw.

Use postpaid card. Circle No. 234



**Using
The
Correct
Fastener?**

**You can solve
this problem.**

Write for free data on
torque/tension relationships.

SKIDMORE-WILHELM
Manufacturing Company

444 S. GREEN ROAD

CLEVELAND, OHIO

Use postpaid card. Circle No. 235

HUCK REALIGNS WESTERN OPERATIONS



CLUTE



KOSTICH



VILLACRES

Huck Mfg. Co. of Detroit has realigned its western sales office with three personnel promotions. Appointment of Ray V. Clute as assistant to the vice president—sales, Richard A. Villacres, western division sales manager, and M. W. Kostich, west coast branch manager, was announced by George Q. Mathews, vice president—sales. Clute has been with the firm since 1948 following two years in project engineering at Cadillac (GM). Villacres will handle eight western states after joining

Huck eight years ago. He previously was foreign sales engineering for Cincinnati Milling Machines. Kostich has been assistant superintendent in one of Huck's Detroit plants and has a background of seven years in warehousing.

STAMETS TO DISTRIBUTE CLEARING PRESSES

Clearing, division of U. S. Industries, Inc., announces the appointment of William K. Stamets Co. to handle the Torc-Pac line of open back inclinable assembly presses. The Torc-Pac line consists of three press sizes—22 ton, 32 ton and 45 ton capacities.

TEVES TO HANDLE GRIES LINE IN SOUTH

The Fred W. Teves Co. of Dallas, Tex., will exclusively handle the Gries Reproducer Corp., New Rochelle, N.Y., line of fasteners to outlets in Texas, Oklahoma, Arkansas and Louisiana. Teves began his organization two years ago after serving as field engineer for the Richardson Co. of Melrose Park, Ill., for seven years. He is a member of the American Society of Mechanical Engineers and the Society of Plastic Engineers.



NEW SALES OFFICES FOR ALLMETAL SCREW

Allmetal Screw Products, Inc., Garden City, L.I., announced the opening of a new sales office in Chicago at 6424 W. Belmont Ave., and a California office and warehouse at 5822 W. Washington Blvd., Culver City.

EUTECTIC WELDING INSTITUTE IN DETROIT

Detroit industries have access to the services of the Eutectic Welding Institute and Technical Information Service at Eutectic Welding Alloys Co. of Michigan, 416 W. Eight Mile Rd. The warehouse-service center will also distribute low temperature welding alloys and fluxes.

Assembly and Fastener Engineering

P-K TURNS TO BULK DISTRIBUTOR STOCKING

The assembly industry can look for improved service and more trained fastener specialists at the distributor level as a result of a "bulk stocking plan" introduced by the Parker-Kalon Div. of the American Transportation Corp., Clifton, N.J.

The novel method of distribution will allow local outlets to stock a complete line of self-tapping screws and allied P-K fasteners in larger-than-ever quantities. This will permit direct-from-the-warehouse immediate delivery, eliminating the delay and extra expense of double-handling and milling from the factory.

Distributors will also carry in quantity many of the specials in general demand.

Part of the program is to provide more technicians capable of handling fastener problems in the field. This is being implemented through two-week training courses held periodically at Parker-Kalon headquarters. Intensive classroom, plant and laboratory sessions cover both practical and theoretical aspects of fastener manufacturing and engineering.

Ed Note: "Assembly and Fastener Engineering" has been represented at these sessions, and will give a complete report in an early issue.

SIMMONS JOINS STANSCREW SALES STAFF

Robert A. Simmons joins the sales force of Standard Screw Co. as a representative of The Chicago Screw Co. Div. in Western Michigan and Northern Indiana. His joint sales-engineering background includes a prior 6-year period with Chicago Screw's Special Products department. The firm has other operations in Hartford, Conn., and Elyria, Ohio, and markets over 4000 fastener items. Simmons is a veteran of six years Navy service.



RETIREMENTS, REPLACEMENTS AT ASC

Associated Spring Corp. has announced the retirement of two veterans in its sales organization at the BGR division in Plymouth, Mich. William J. Black, sales manager, retired after 39 years and Fred Adams, assistant, retired after 31 years service. Assuming new duties are George C. Sessions and John B. Barr.

MILWAUKEE ELECTRIC NAMES SALESMEN



EVANS

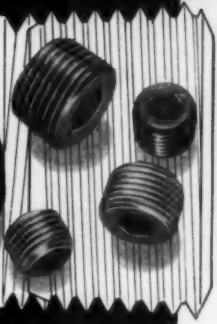


NEWMAN

New district representatives for the Milwaukee Electric Tool Corp., Milwaukee, Wis., are Mel Newman and Roy A. Evans. Newman, formerly in the sales department of Allis Chalmers, will cover Louisiana and southern Texas from his home in Dallas. Evans will handle Alabama, Georgia and Florida. He is a recent graduate of Georgia Tech and makes his headquarters in Atlanta, Ga.

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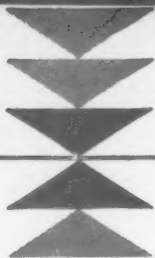
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ONE LAST WORD

WHO, IF NOT YOU? WHEN, IF NOT NOW?



Until recently, I have wondered why some men accomplish so much more than others in like positions. This sort of thing disturbs me greatly. These architects of mighty deeds appear to be supermen, or at best, especially endowed by nature. I look with awed eyes on those who continually find time for another project and who, easily and smoothly, appear to squeeze 36 hours out of every 24-hour day.

I found the answer in the office of a chief engineer with a reputation for getting things done. This engineer is never too busy with his regular work for another project, or another study, to handle this matter or that, make speeches, write articles, lead meetings, or help his colleagues in their work.

He arrives at his desk at 8 every morning and leaves the office promptly at 5 every afternoon. He doesn't rush, and he's in the best of health.

His associates say he's very efficient, but he doesn't think of it in terms of efficiency, saying merely, "It's got to be done, so I do it." And I wonder if efficiency isn't just that, and no more: doing the job that needs doing right now. Not tomorrow, next week, or sometime when one happens to be in the neighborhood, but right

now. Procrastination is the thief of time, Edward Young tells us. Every job that's put off detracts from the total of final accomplishment. A neglected undertaking digs its own grave.

The year ahead will be uncertain: if it's good you must produce more, if it's bad you must produce more economically. In any event, solemn obligations will be on your shoulders and weighty responsibilities will test your mettle. Whether you're responsible for an overall operation or a segment of it, new methods, more economical techniques, more reliable fastening and assembling should be, in addition to your regular work, your business. Break the back of the project you've been dreaming about for a year right now: not tomorrow—not the next guy—but you, right now.

This all reminds me of a sign I saw hanging in someone's office:

"Who, if not you?"

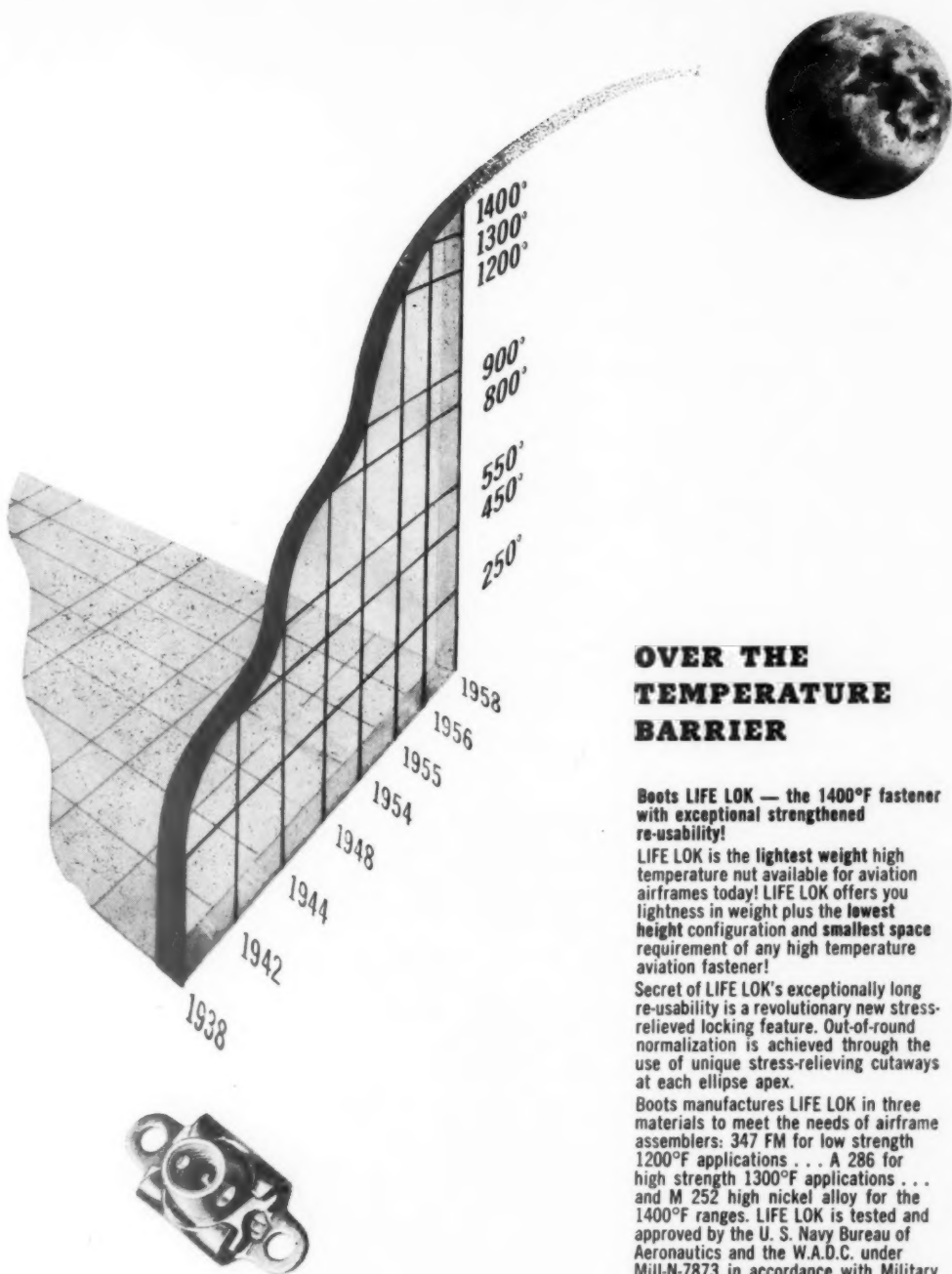
When, if not now?"

This sign seems to sum up the entire question of human efficiency, and I'm having a few cards printed with this quotation to hang over the desk. If you'd like a copy drop me a line and I'll send one along.

Have a happy and healthy new year.

Wm. J. Schleicher

Vice President & Editorial Director



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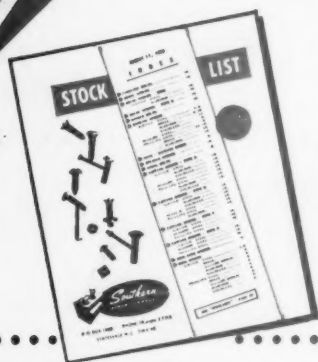
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